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SPECIAL ARTICLE.

THE ADMINISTRATIVE CONTROL OF TUBERCULOSIS.

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WHEN we consider the transcendent importance to the human race of the observations of Koch on the etiology of tuberculosis, and the completeness of his demonstration of the communicable and preventable character of the disease, it seems difficult to understand the limited extent of the sanitary procedures since adopted for its restriction. The imperative demand for the enforcement of comprehensive measures for the prevention of tuberculosis should have been as evident to sanitarians twenty years ago as it is to-day. No facts have been added to our knowledge within this period which are really essential to the intelligent sanitary surveillance of this disease. The universal prevalence of the disease, its infectious and communicable character, its preventability and curability, all of these facts—the important ones bearing on the administrative control—are not of recent discovery. They have not been developed by the agitation of the past few years, but were as manifest to the student of this subject fifteen or twenty years ago as they are now. Very slowly has a partial comprehension of the tremendous significance of these simple well-known facts forced itself on the minds of the medical profession, the sanitary and civil authorities, and the people. But even now, only here and there throughout the civilized world have measures been put into effect looking to the administrative control of tuberculosis. Notwithstanding all that has been said and written, notwithstanding the popular education and agitation, notwithstanding the formation of antituberculosis societies and antituberculosis leagues, notwithstanding the organization of many associations for the erection of sanitoria, and the foundation of institutions for the study of tuberculosis, notwithstanding the measures adopted for the prevention of the disease in animals, still only a very small percentage of the governmental municipal and state sanitary authorities of this country, Great Britain and the Continent have adopted provisions which can be regarded as in any way comprehensive, or effective in dealing with this disease.

If we seek for an adequate explanation for this attitude, it is not after all difficult to find. In speaking of this matter several years ago, Koch said in substance to the writer, "the adoption in Germany of such measures as are already in force in New York City will not be possible until the generation of medical men now in control have passed away. Not until a younger generation has appeared, which has had a different scientific training, and holds views more in harmony with the known facts regarding the etiology of tuberculosis, will it be possible in my opinion to bring about an intelligent supervision of this disease."

The idea has been so firmly fixed in the minds of the authorities and of the medical profession, that administrative control applies only to the more readily communicable acute diseases, like smallpox, scarlet fever, diphtheria, etc., that the inclusion of tuberculosis with these diseases has seemed to them impracticable, and the enactment of suitable legislation conferring power on the authorities to deal with this disease in another way has either not been considered or has been regarded as impossible. In only a few instances have effective measures been adopted, and in these instances, as was the case in New York, the power has usually rested with the sanitary authorities themselves to determine what diseases should come under their surveillance, and under what conditions.

Notification is a necessary preliminary to any plan of supervision, and yet only five years ago a special commission of the Academy of Medicine of Paris reported against a proposition to place tuberculosis in the class of notifiable diseases. Two principal reasons were advanced against the proposition: First it was pointed out that notification involved the divulging of a medical secret, which would be harmful to the patient (this applies of course with equal force to the diseases usually called contagious); and it was furthermore insisted that as the public did not regard tuberculosis as being contagious, or in the same class with the contagious diseases, but considered the disease hereditary, the public would not accept such a legal enactment without protest and resistance. The second reason was regarded as more important and was in effect that in a family unwilling to follow instructions sanitary restrictions would be impossible, as an almost continuous intervention would be required on the part of the sanitary officers for months and years. The only efficient alternative in such cases, it was pointed out, would be the consignment of the consumptive to a hospital, a practice followed in Norway. The Commission concluded that compulsory notification must not be considered, at least at that time.

Sir Richard Thorne, the Medical Officer to the Local Government Board of Great Britain, in the Harben lecture in 1898 on "The Administrative Control of Tuberculosis," after a careful

consideration of the various problems presented under the English law relating to infectious diseases, pronounced definitely against this proposition, on the ground that the hardship to the individual, which would follow notification and the enforcement of proper regulations, would be so great as to render this measure unjustifiable. In the same year the Academy of Medicine of New York, through a special committee appointed to consider the regulations, which had then been adopted by the Department of Health of New York City regarding notification, declared it as its opinion that the procedure was at that time inexpedient and inadvisable. Every important medical society in New York City then expressed even more strongly, than the committee of the Academy the opinion that the action of the Health Board was unwise and unwarranted.

In the action of these and other societies and commissions, and in the opinions expressed by various authorities throughout the world, it has always been evident that they have been influenced by precedents as to the functions of the sanitary authorities, and have felt very strongly the striking difference between tuberculosis and the diseases, which had previously been subject to sanitary control. It has often been pointed out that the so-called contagious diseases are acute, and the whole history of even the most protracted case is comprised within a period of a few weeks, or at most a few months, whereas with tuberculosis, the infectious period usually extends not simply over a few months, but more frequently over several years, and it may comprise half a lifetime.

The contagious diseases usually entirely incapacitate the individual, during the early period at least, and the dangers of the transmission of the infection are so great and the evidence of it so immediate, that no questions can properly be raised as to the justification for proper isolation and supervision. On the contrary, all authorities agree that under proper conditions the consumptive is not necessarily a source of danger, even to his most intimate associates. He may be able to pursue his usual avocation for years. The danger of the transmission of the disease is much less evident, and the source of infection is much more difficult to trace.

The consideration of these and other important points of difference between tuberculosis and the contagious diseases has dominated the situation. It has seemed difficult for the medical or lay sanitary authorities to understand, that with the new knowledge afforded by the observation of Koch and others an entirely different sanitary problem was presented for their consideration, and that for its solution new methods must be adopted. Very gradually comprehension of this simple and apparently quite self-evident fact has forced itself upon them. It may be said, I think, to be now an almost universally accepted fact that some kind of action or supervision is justifiable and necessary, and the only difference of opinion is as to the extent of the measures which should be adopted and as to the manner of their enforcement.

It is my desire in this address to present for your consideration, what it seems to me these procedures should be, and also in part what they are now in New York City. I may say in passing that so long ago as 1887 I had the privilege, in conjunction with the other consulting pathologists to the Department of Health of New York City, of advocating the adoption in New York of measures almost as comprehensive as those now in force, but it was so evident at that time, that neither the medical profession nor the people of the City would approve these measures, that the Board of Health felt their immediate adoption in toto was inadvisable.

What measures then does the efficient administrative control of tuberculosis require?

1. The compulsory notification and registration of all cases is essential. The fundamental importance of this measure is so evident that its consideration seems hardly necessary. It must of course appear at once that unless there is a system of compulsory notification and registration, the enforcement of any uniform measures for prevention is impossible. Practical experience with this procedure has made it perfectly clear that the objections which have been urged against it are without force or foundation.

In New York City in 1893 a system of partially voluntary and partially compulsory notification was adopted. Public insitutions were required to report cases coming under their supervision; private physicians were requested to do this. Under this provision the Department of Health carried on this work for three and a half years, and then adopted in 1897 regulations requiring the notification of all cases. For a number of years, while continuous pressure was brought to enforce this provision, it was not strictly enforced, although more and more complete compliance with its requirements was each year attained.

It has already been said that as tuberculosis radically differs from the more readily communicable diseases usually called contagious, so the measures for the sanitary supervision of tuberculosis must differ from the measures adopted in this class of diseases. This should be the attitude of the health authorities always, in the enactment and enforcement of all regulations. The information contained in the reports of cases should be regarded as confidential information, and action should only be taken by the authorities in those instances, where the conditions require it.

The notification of a case of tuberculosis does not require any action on the part of the authorities, if it seems reasonable to assume that such action is unnecessary. The very fact that tuberculosis is notified by the attending physician as a communicable disease has the greatest educational value, and justifies the assumption in those instances, in which the case is under the supervision of a private physician, that reasonable and necessary precautions for the protection of others

TABLE SHOWING DEATH RATES FROM ALL CAUSES AND DEATH RATES FROM TUBERCULOUS DISEASES PER 1,000 POPULATION IN NEW YORK, LONDON, PARIS, BERLIN AND VIENNA, FROM 1884 TO 1903 INCLUSIVE.

	NEW YORK		LONDON		PARIS		BERLIN		VIENNA	
Year.	General death rates.	Tubercu. death rates.	General death rates.	Tubercu. death rates.	General death rates.	Tubercu death rates.	General death rates.	Tubercu. death rates.	General death rates.	Tubercu. death rates.
1884....	25·82	4·45	20·39	3·12	25·44	5·19	26·3	3·6	26·8	7·2
1885....	25 55	4·36	19·67	2·90	24·38	.....	24·4	3·6	28·5	7·2
1886....	25·99	4·42	19·89	2·93	25·25	5·56	25·6	3·4	26·6	7·0
1887....	26·32	4·06	19·53	2·71	23·92	5·15	21·8	3·1	25·8	6·4
1888....	23·39	3·99	18·42	2·54	22·92	4·93	20·3	3·1	25·2	6·2
1889....	25·32	3·86	17·47	2·56	23·78	5·11	23·0	3·3	24·5	5·8
1890....	24·87	3·97	20·98	2·94	23·70	5·26	21·5	3·0	24·4	5·8
1891....	26·31	3·56	21·11	2·81	22·45	5·13	20·8	2·9	25·0	5·7
1892....	25·95	3·55	20·31	2·68	23·24	4·54	19 9	2·6	24·9	5 5
1893....	25·30	3·51	20·83	2·65	22·25	4·92	21·0	2·7	24·0	5·1
1894....	22·76	3·16	17·80	2·43	21·32	5·10	17·6	2·5	23·2	5·0
1895....	23·14	3·35	19·8	2·50	22·3	5·0	20·0	2·6	23·3	5·2
1896....	21·84	3·11	18·8	2·40	20·1	4·8	18·1	2·5	22·3	4·9
1897....	20·03	2·98	18·1	2·46	18·6	4·6	17·7	2·5	20·9	4·7
1898....	20·46	2·99	18·7	2·48	19·7	4·79	17·3	2·4	20·1	4·3
1899....	19·81	3·08	19·8	2·55	21·5	5·12	18·7	2·6	20·9	4·7
1900....	21·04	3·01	18.6	2·42	22·1	5·46	19·0	2·67	21·0	4·76
1901....	20·66	2·89	17·1	2·34			18·0	2·52		
1902....	19·49	2·68					16.1	2·39		
1903....	19·10	2·79								

GREATER NEW YORK		
Year.	General death rates.	Tubercu. death rates.
1898....	20·26	2·69
1899....	19·47	2·70
1900....	20·57	2·80
1901....	20·00	2·65
1902....	18·75	2·45
1903....	18·18	2·49

will be taken. If. however, the consumptive has the disease in an infectious stage and is without a home, or is living in a lodging house, or in a poorly furnished room, or in a family in a tenement house, or is receiving charitable medical advice through some public institution, then all objection to the interference or the supervision of the authorities is removed, and in the interests of the public such interference and supervision become necessary. Such is the attitude which has been adopted in New York City. It is assumed and stated positively that in all instances where the consumptive is under the care of a private physican and the latter will undertake to give such instructions as are necessary to prevent the transmission of the disease to others, no further cognizance of the case will be taken by the health authorities after the registration.

The fact should be strongly emphasized again, that the mere fact of notification and registration has in itself a very powerful educational influence. During the year 1902 more than 16,000 cases were reported to the Department of Health in New York City, of which 4,200 were duplicates, and in 1903 more than 17,000 cases were reported.

2. To facilitate the early and definite diagnosis of all cases of pulmonary tuberculosis, the sanitary authorities should afford facilities for the free bacteriological examination of the sputum in all instances of suspected disease. In a large proportion of the cases of early disease the physical signs and the symptoms are not sufficiently definite to permit a positive diagnosis by the general practitioner. An expert may easily arrive at a positive conclusion, but the general practitioner remains in serious doubt. In the absence of a positive result from an examination of the sputum, the attending physician awaits the appearance of more definite signs, and thus too often loses most valuable time, for these more definite signs mean further extension of the disease in the lungs. In some institutions and with many physicians, the positive position is assumed that no case is to be regarded as tuberculosis of the lungs unless tubercle bacilli are found in the sputum. I need hardly point out how erroneous and dangerous is this opinion.

It is of course of vital importance that the diagnosis in every case should be made at the earliest possible moment. A large proportion of the medical profession, in the large cities particularly, have not the facilities, nor are they competent to make such bacteriological examinations. The Department of Health of New York City provided facilities for such examinations in 1894, early in the history of its attempt to exercise control over the disease, and this procedure has proved of very great value to the medical profession, to the sick, and to the authorities. Following the example of New York City, other sanitary authorities have adopted similar measures, and I think it is the general opinion now, that such free bacteriological examinations should be made by

the authorities, and that every convenience and facility for them should be afforded. It is a curious fact in this connection, that large numbers of physicians in private practice who are unwilling or reluctant to directly report cases of tuberculosis, without hesitation send specimens of sputum for examination, with all the facts in relation to the patient which are necessary for registration. It is only on this condition that the examinations are made. During the year 1903 more than 11,000 specimens of sputum were examined in the laboratories of the Department of Health. These specimens came almost entirely from physicians in private practice. There are about 200 depots in New York city where the outfits, blanks, etc., for the collection of specimens of sputum may be obtained and where the specimens may be left for the Department collectors.

3. *Educational Measures.*—It is difficult to overestimate the importance of the duties of the sanitary authorities in the education of the medical profession and of the people on the subject of tuberculosis. Circulars designed to reach different classes of the community and covering different phases of the subject should be widely distributed, and the public press should be utilized to the very largest extent in the diffusion of information. The circulars as issued should be given to the press for general publication. A very important function is performed in this connection by the various lay societies, associations, leagues, etc., organized for the prevention of this disease. By the means of circulars widely distributed through every possible channel, and general agitation in the lay press and numerous and repeated lectures before all classes of the community, a very broad dissemination of knowledge as to the nature of tuberculosis and the means to be adopted for its prevention may be attained. I need not further refer to this phase of the subject.

4. *The Visitation of Consumptives in Their Homes.*—An important part of the work of the authorities consists in the immediate visitation by a physician or trained nurse of every case of tuberculosis not under the care of a private physician or in a public institution as soon as it is reported. At these visits verbal instructions should be given, and printed circulars left for the information of the patient and the family. At the same time data should be gathered as to the history of the sick person and of the family, its social condition and financial income, the number of persons in the family and their wages; the number of cases of tuberculosis which have occurred, the probable source of infection in the individual; the sanitary condition of the premises, the amount of air space for each person, the character of the light and ventilation, the precautions being observed and the possible need of any further interference on the part of the authorities. In the course of these visits it becomes evident in many instances that a patient should be removed to a hospital or sent to a sanatorium outside of the city. In such instances, if possible, the patient should be induced by persuasion to avail himself or herself of such institutional care as seems desirable or available. If the patient persistently refuses institutional care, forcible removal must be resorted to in those instances in which the unsanitary conditions existing render it necessary.

5. The disinfection or renovation of rooms or apartments which have been vacated by consumptives either by death or removal. Trained medical inspectors should be sent whenever it comes to the knowledge of the authorities, that premises have been vacated by death or removal, and proper measures adopted to enforce disinfection of the premises by means of formaldehyde gas, or thorough renovation. In those instances in which the premises are dirty and filthy, and the walls and ceilings are in bad condition, renovation, to be performed by the owners, should be required. If necessary for this purpose, the apartments may be vacated, or if already vacant, the occupation by others must be prohibited until such renovation has been completed. Carpets, rugs, clothing, pillows and mattresses, and any bedding or other textile fabrics, which cannot be properly disinfected by formaldehyde, should be removed by the authorities, and subjected to steam disinfection. Disinfection should be carried out by the health authorities without cost to the occupants or owners, but the cost of renovation, when required, should be borne by the owner of the premises.

A serious difficulty exists in this connection because of the frequent changes of residence of some families containing consumptives; and as the families become constantly poorer on account of the financial loss and expense entailed by the illness, they move continually to a poorer and poorer class of tenements. It is often impossible to trace them, or to obtain information of their change of residence, so that proper disinfection of the apartments may be ensured. The owners of the property may of course be required to furnish information of the removal, but there is danger lest this course may eventually entail some hardship on the poor consumptive in rendering it more difficult for him to find lodgings. This is the most troublesome problem to solve which we have found in New York. I do not feel sure that eventually notification by the owner of the removal of a consumptive will not be necessary, as the only solution of this difficulty.

6. Provision should be made for making repeated visits to cases in tenement houses, when for any reason it has been undesirable or impossible to remove the patient to an institution. These revisits may usually be best made by trained nurses. In this way information may be gathered as to changes of residence, as to the efficiency of the precautions adopted by the consumptive, as to the changes in his physical condition or the financial resources of the family, and as to the necessity of any alteration required in the sanitary treatment of the case.

7. Suitable food, especially milk and eggs,

should be provided by the sanitary authorities or by other authorities having supervision of such affairs in those instances, in which the families are in such destitute circumstances, that proper or sufficient food cannot be obtained by them, and when the patient for any reason cannot be removed to an institution.

Some very difficult economic problems are presented in some of these cases. For example: A family consists of a mother with moderately advanced consumption and five small children; the father is dead; the income of the family from all sources is insufficient to maintain it properly and furnish the mother with suitable food. But the apartments are well ventilated and sufficiently commodious, they are clean and neat, and the mother makes every effort to obey every instruction and heed every suggestion. She insists on remaining with her children, and her presence is necessary to keep the family together. Undoubtedly the mother would be better off in an institution, and thus too the children would be removed to an institution for children, and would be better protected from the danger of tubercular infection. But then the children grow up as institutional children, which is most unfortunate, and, furthermore, there is no sufficient sanitary ground for the forcible removal of the mother. Under such conditions, for the present at least, I believe, the authorities should provide or see that there is provided, such food or other assistance as is required.

If, however, the apartments are dirty and not well kept, or are small, dark, and badly ventilated, or the instructions are not followed and proper precautions are not taken, then the family should be broken up, the mother should be removed to an institution, if necessary by force, and the children otherwise provided for.

No uniform regulations can be laid down for the disposition of such cases, but each one must be considered on its merits, and the ultimate decision in each instance determined after a careful consideration of all the facts.

The authorities should, however, recognize their responsibilities as to the provision in some instances of food, or other assistance, and should have means at their disposal for this purpose. If this assistance is dispensed by other authorities than the health authorities, it should be under the latter's direction and supervision.

8. The sanitary authorities should provide, or see that there are provided, and should supervise, three classes of institutions for consumptives:

Free Dispensaries.—In these free dispensaries medical treatment for ambulatory cases should be provided. These cases should be constantly under the supervision of the district physicians and nurses attached to the dispensary. Where necessary, not only medicines, but food, should be furnished free by the dispensary to the consumptive poor. The dispensaries should also act as clearing houses for consumptives, and should serve as places to which all institutional cases on their discharge from institutions and all poor cases receiving the care or assistance of charitable organizations should be referred for medical care. From this dispensary suitable cases should be referred to either a sanatorium or a hospital, as seems necessary.

Hospitals for the Care of Advanced Cases.—It is not necessary that all the hospitals for the care of advanced cases should be directly under the control of the sanitary authorities, although they should exercise a general supervision over these institutions. It is necessary, however, at least in a very large city, that the authorities should have control of at least one institution with adequate facilities for the care of certain varieties of advanced cases of the disease, which it may be necessary to forcibly remove to the institution and retain there against their will. These are of several types: First. Those which are discharged from other institutions, because they are from the institutional standpoint exceedingly undesirable patients, or because they have violated the regulations of the institution. A moment's consideration will show that the sanitary point of view and that of the authorities of an institution widely differ. In order to maintain the discipline of an institution cases which persistently violate its regulations must be dismissed. From the sanitary standpoint, these are of all cases those which it is specially important should be provided with institutional care. Homeless, friendless, dependent, dissipated and vicious consumptives are those, which are likely to be most dangerous to the community. If not cared for in an institution, they are wandering from place to place, living in lodging houses or sleeping in hallways or wherever cover can be found; negligent as to the disposal of their expectoration, and disseminating infection in every place which they visit. Such cases must be provided for by the sanitary authorities at any cost, and if necessary they must be removed by force to proper institutions and there detained.

Second.—Cases living in lodging houses, or those which are inmates of public institutions not having facilities for their care, who are unwilling to enter any of the institutions, which are available, must be provided for and must be in the same way removed, by force if necessary, and detained.

Third.—It not infrequently becomes necessary in a large city to remove from their homes, cases which are almost necessarily sources of danger to the other members of their family; in those instances in which the sanitary conditions are very unfavorable, when there is great poverty, destitution, or overcrowding, and when the patients themselves are unwilling to enter an institution, the health authorities must intervene and remove such patients by force and detain them.

Fourth.—There are numerous cases which have already been under the care of an institution, and which become for some reason dissatisfied with their care and are determined to return to their homes. In these instances when the family is unwilling or unable to provide properly for

them, the patients should be removed by the health authorities and retained under supervision.

It will be readily understood that the classes of cases, which have been referred to as necessarily coming under the supervision of the health authorities are generally very undesirable and difficult to control. Yet the experience of the Department of Health of New York has shown, that rarely is any real difficulty experienced in the management of these cases, if the accommodations which are provided and the food and care given are of a superior character. It will be readily understood, that the measures suggested here can only be taken, where the sanitary authorities have full power and control, and that patients can be retained only in institutions over which they have direct authority. So far as I am aware the forcible removal of tuberculous patients has not been attempted by any sanitary authorities excepting those in New York City.

Sanatoria.—The sanitary authorities should provide or have available, proper sanatoria in favorably situated country districts for the care of early and incipient cases. No further comments seem necessary on this phase of the subject. It is evident that as the authorities have to deal with both the prevention and care of tuberculosis, such institutions are imperatively demanded. As has often been pointed out, every early case removed to a sanatorium, not only removes the individual who may be for a long period a source of danger to others, but also affords the best chance for recovery. Such patients when cured and discharged from the sanatorium are educational factors of no small moment in the community.

9. The sanitary authorities should issue regulations applicable to public institutions as to the care of consumptives. The admission and treatment of such patients in the general wards of general hospitals should be prohibited, and all public institutions caring for such patients should be required to provide separate rooms or wards. These regulations should apply not only to general hospitals, but also to the hospitals for the insane, to penal institutions, homes, asylums, etc. Suitable regulations should be formulated in regard to cases occurring among the teachers or pupils in the public schools and as to employees in factories, workshops and mercantile establishments, and as to occupations of a nature which are likely to disseminate the disease.

10. The sanitary authorities should enact and enforce regulations prohibiting spitting in all kinds of public conveyances, such as street cars, steam railroad cars, ferry-boats, etc., and on the floors of public buildings and places of public assembly, such as ferry-houses, depots, etc., and in the halls of tenement houses, theaters, in factories, etc. Spitting on the sidewalks should also be prohibited.

The fundamental importance of the careless disposal of sputum in the causation both of pulmonary tuberculosis and the acute respiratory diseases has not been fully recognized, I believe. It seems to me that here is the keynote to the whole question of the prevention of the diseases of the respiratory organs. In various forms of pneumonia as well as in tuberculosis, the causative microorganisms are found in the secretions of the respiratory tract; and when these secretions are not properly destroyed at the time of their discharge from the body, they become more or less widely scattered, dried, pulverized and suspended in the air as dust. Practically all of the organisms causing these diseases belong to the class which do not find favorable conditions for their multiplication outside of the living body, and therefore when they are effective in the causation of disease, it is because they have been derived definitely from some other single case of disease. It is of vital importance in the propaganda for the prevention of tuberculosis and also of pneumonia, that we should educate all classes of the people to a recognition of and a belief in the fundamental importance of the proper disposal of the expectoration and should gradually inculcate the idea that the habit of spitting carelessly anywhere is not only filthy and indecent, but as in many instances to be regarded as almost criminal. When we have educated the mass of people up to this view, so that this habit of spitting will not be tolerated, the chief factor in the solution of the problem of the prevention of tuberculosis will, in my opinion, have been found.

A number of measures of minor importance in the surveillance of the tuberculous diseases have been in operation in New York City. Among these may be mentioned, the semi-annual census of the cases of pulmonary tuberculosis under treatment in public institutions in the city. It has also been the custom during the last two or three years to communicate with the attending physician in cases of tuberculosis, which have been reported through the sputum examination or directly, and to enquire whether the patient is still under treatment, and if so, whether improvement has taken place or not, and whether the physician has any objection to a visit being made to the patient if he or she is not at that time under his observation. If the physician replies that the patient has passed from his observation, and he has no objection to an investigation by the department, an effort is made to locate the patient and determine what the condition is.

Sanitary cuspidors are supplied by the department through trained nurses for the use of patients who are very poor in the tenement house districts, and large numbers of these cuspidors have also been supplied to various charitable societies, which have supervision of, or are extending help to cases of consumption in their homes.

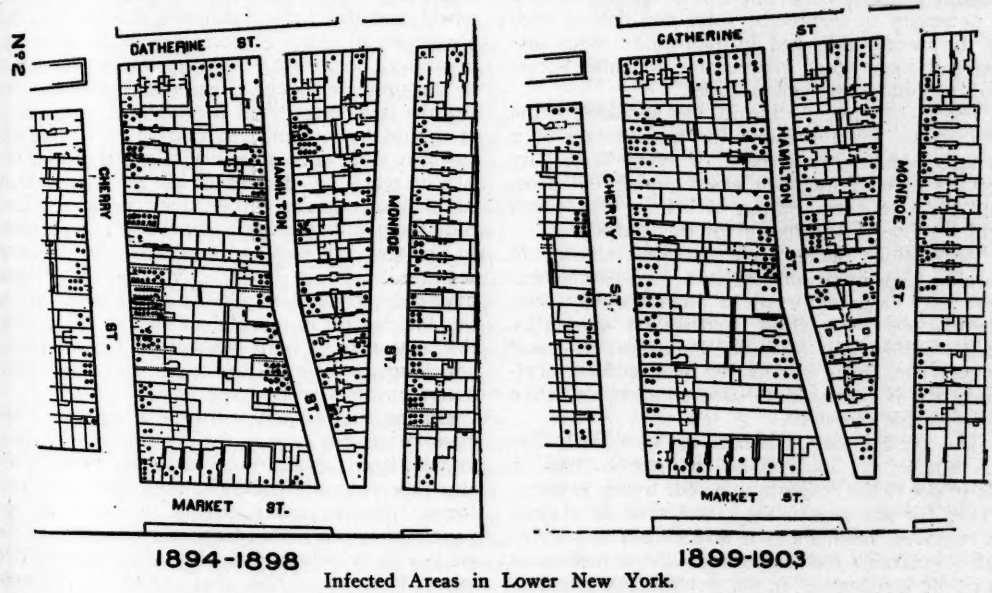
Large numbers of circulars of information have also been supplied to these societies for distribution, and similar circulars in various languages have been furnished to various labor unions for distribution among their members.

The inspectors of the Tenement House De-

partment in the course of their house to house inspection, report to the Department of Health any cases of apparent tuberculosis which they may find and these are investigated by the Department of Health.

In the very beginning of the work in New York, sectional maps of the Borough of Manhattan were prepared showing every house lot in the borough on a sufficiently large scale so that all cases of tuberculosis which came under the observation of the department and all deaths from this disease could be plotted, to show the topographical distribution of the disease. I have had some of these reproduced to show the extraordinary prevalence of the disease in some of the crowded tenement house districts.

Attempts are now being made to secure the condemnation by the city of several areas in the tenement house districts in which tuberculosis has been particularly prevalent.



Infected Areas in Lower New York.

One minor measure which has been found of a good deal of service in New York has been the house to house inspection in tenement house districts by women physicians in the search for unreported cases of tuberculosis. Quite a large number of such cases have been found in this way, especially among the foreign population. It is also of the greatest importance in this connection, that the trained nurses and medical inspectors should know the language of the people whom they are visiting. Great care has been taken, as far as it was possible under the civil service regulations, to obtain trained nurses and physicians who speak foreign languages. We have now engaged in this work, nurses who speak French, German, Yiddish, Russian, Italian and Polish.

These measures as detailed seem to me to include the more important provisions of a scheme for the efficient administrative control of tuberculosis. Several questions arise in this connection: (1) Is such a scheme feasible and practicable? (2) Are there serious objections to the enforcement of the measures proposed? (3) What results may be reasonably expected from the enforcement of such measures?

In answer to the first question—Is such a scheme of sanitary surveillance of tuberculosis feasible and practicable? I would say decidedly, it is. In its main and most important features such a plan has been in force in New York City for a number of years. The feasibility and the practicability have been conclusively demonstrated by an experience in the second largest city in the world. In only a few of the less important details is the general plan as now followed in New York wanting. Referring to these measures specifically, it may be said as to registration, that nearly 13,000 new cases were registered in the year 1903 in New York City; and over 11,000 specimens of sputum were examined. Large numbers of circulars of various kinds designed to reach different classes of the community are being and have been issued each year. During the last year over 100,000 "Circulars of Information for Consumptives and Those Living With Them" were issued by the Department of Health. These were printed in many different languages, for example: English, German, Italian, Yiddish, Chinese, Russian, Ruthenian, Polish, etc.

All cases of tuberculosis reported to the department not under the direct care of a private physician are regularly visited by medical inspectors and trained nurses, and the main facts in regard to the individual, family, sanitary conditions of the premises, etc., are gathered; instructions are given and circulars of information

left. All rooms or apartments which have been vacated by consumptives either by death or removal, so far as the department can obtain such information, are either immediately disinfected, or renovation is ordered and their occupation by others prohibited until the orders are complied with. Carpets, rugs, pillows, mattresses, etc., are removed by the department, disinfected by steam, and returned. Provision is made for continuous supervision of such cases as remain in tenement houses and require such supervision, through trained nurses and medical inspectors.

A special dispensary for the treatment of consumptives has been provided and is just about to be opened by the Department of Health, where it is proposed that treatment, medicines and necessary food shall be furnished free of charge. A series of pavilions have been opened by the Department of Health for the care of those, whom it is necessary to remove by force and detain, such as the undesirable and insubordinate cases discharged from other institutions, and also homeless, friendless and vicious cases.

The Department of Health has appealed to the city authorities for funds for the erection of a suitable sanatorium outside of New York City for the care of incipient cases among the poor, and there is every reason to believe that funds will soon be forthcominig for this purpose.

Regulations have been enacted relating to careless expectoration, and to a considerable extent have been enforced in public conveyances. Regulations prohibiting spitting on sidewalks, in the public halls of public buildings, tenement houses, etc., have not as yet been enforced, although it is proposed to soon adopt more active steps in this direction.

The Department of Health of New York City has not as yet undertaken to provide food or assistance to the consumptive poor living at home, where for any reason they cannot or should not be removed, neither has it undertaken to provide full regulations for the supervision of such cases in public institutions, in the public schools and as regards employees in factories, and occupations in which consumptives are likely to be a source of danger.

Excepting in these respects, the scheme as presented is practically in force now in New York City, the extent and the strictness of the supervision having each year during the last ten years been materially increased. What, therefore, is practicable and feasible in New York should be practicable and feasible in cities of smaller size, and it should be possible to enforce more readily and more satisfactorily similar regulations in them.

As to the second question—Are there serious objections to the enforcement of such a scheme, or are the objections valid which have been urged by some authorities? the reply to this is decidedly in the negative. Very great opposition met the proposition of the Department of Health to undertake this work in the beginning and many difficulties were encountered in the early years owing to this opposition. But experience has shown that the obstacles are largely imaginary; that the harmful results which were predicted as certain to follow, have failed to materialize. Practically no serious difficulties are encountered in carrying on the work. I would say that the difficulties with reference to the work of the department in New York in relation to tuberculosis are really less serious than those encountered in connection with the contagious diseases. There has been hearty approval by the majority of the medical profession, and acquiescence by the remainder.

In answer to the third question—What may be reasonably expected from the enforcement of such measures? we find again an answer in the experience of New York. There has been a more rapid fall in the tuberculous death rate in New York City, than in any great city in the world, and this notwithstanding the fact that the conditions in many respects are much more unfavorable, because of the very dense population in the great tenement house districts of the city and the large element of foreign-born population. It should be remembered that in no city of the world is there such a density of population as exists in many of the wards of the Borough of Manhattan. In numerous districts on the East Side the population varies from 600 to 800 people to the acre, whereas the most densely populated districts of Paris, London, Vienna and Prague have only 400, or less persons to the acre. When this fact is kept in mind, the difficulty in reaching the large foreign born element of the population, which speak their native tongue and retain their native customs will be appreciated.

During the last ten years there has been a decrease of 40 per cent. in the death rate in children under fifteen years from pulmonary tuberculosis and tuberculous meningitis, these being the two forms of tuberculous disease in which an approximately accurate diagnosis is likely to be made. It is precisely in this, the youngest element of the population, that one would first look for definite results from the enforcement of measures for the restriction of this disease. There has also been a decrease in the total tuberculous death rate between 1887 and 1902—a period of sixteen years—of 40 per cent.

A considerable fall in the death rate from tuberculosis has been noted in various countries and cities and it has been maintained and apparently shown, that the decrease was only in small part a real decrease and was accompanied by an almost equal increase in the death rate from the acute pulmonary diseases, notably pneumonia. The claim has been made that there has been simply a substitution in the death returns of pneumonia for tuberculosis. Very great care has been taken in New York City to investigate this phase of the problem and it may be said in the first place, that no corresponding increase has taken place in the death rate from the acute pulmonary diseases. A small increase has occurred since the first great grip epidemic in 1890, but this increase amounts

to only about 10 per cent., and is, I believe, undoubtedly due to the influence of grip in increasing the death rate from the acute pulmonary diseases.

During the last three or four years, at intervals, all of the pneumonia deaths have been compared with the index of tuberculosis cases reported, to determine whether any cases reported as tuberculosis were subsequently returned as having died from pneumonia. This investigation showed a very small number of cases of this kind, not exceeding three or four a week in the Boroughs of Manhattan and the Bronx and subsequent investigation in these, in the majority of instances showed that a reasonable doubt existed as to whether they were tuberculous originally or whether tuberculosis was at all a factor in the causation of death. In addition to this, during the last three or four months, especial detailed investigation has been made of all the deaths reported from pneumonia, occurring in persons over five years of age and not reported by large public institutions. The latter were excluded because it seemed fair to assume that the reports of death from large public institutions could be relied upon as accurate. Some hundreds of deaths of this sort have been investigated, to determine whether the history of the disease as given by the family and the attending physician justified the assumption that death was really due to tuberculosis and not due to pneumonia. The results of these investigations have again shown that in a surprisingly small number of them was there any real reason for assuming that tuberculosis was a factor in the causation of death.

The investigation of these pneumonia deaths is still being continued and in all instances, where the facts justify the assumption that death was due to tuberculosis, the death records are correspondingly changed. As further investigation has shown that nearly 90 per cent. of the deaths returned as due to tuberculosis have been previously reported to the department as suffering from tuberculosis, the conclusion seems to be thoroughly substantiated that the decrease in the deaths from tuberculosis is a real one and not in any material respect merely apparent.

I do not at all intend to indicate that the whole of the reduction in the death rate from tuberculosis in New York City has been the result of the measures directed especially against this disease, for many other factors have undoubtedly contributed to it, but I do believe that the very great and rapid fall in the tuberculous death rate is the direct result of the application of these measures; and I fully believe that the next fifteen years will see a reduction quite equal to that which has already taken place.

If we accept at all the necessary deductions of our scientific convictions in relation to tuberculosis, there can be no escape from the conclusion that tuberculosis is of all the important infectious diseases with which we have to deal, certainly the most preventable. I am not only prepared to accept fully the deductions from the known facts in regard to this disease as to the possibilities in its prevention, but would regard the experience of New York City as furnishing conclusive proof of the truth of this conclusion.

This is the great urgent sanitary problem of the new century. In no other direction can such large results be achieved so certainly and at such relatively small cost. The time is not far distant when those States and municipalities, which have not adopted a comprehensive plan for dealing with tuberculosis will be regarded as almost criminally negligent in their administration of sanitary affairs and inexcusably blind to their own best economic interests.

ORIGINAL ARTICLES.

HOUSE INFECTION OF TUBERCULOSIS.

BY LAWRENCE F. FLICK, M.D.,
OF PHILADELPHIA.

THE kaleidoscopic phenomena of this earth, as we see them around us, are the result of a continuous alternation of life and death. In this beautiful panorama death is as necessary as life. Something is always dying that something else may live. Inorganic matter continuously is being changed into organic matter and organic matter into inorganic. For changing organic matter into inorganic matter God has created the microorganic world.

A microorganism which perhaps has slipped away from its natural place in organic nature and in consequence has done much damage to man is the tubercle bacillus. In the great division of organic matter it generally is credited to the vegetable kingdom. In a classification of microorganisms it is technically known as a facultative saprophite. By this is meant that ordinarily it gets its living as a parasite on some higher organism but that it may subsist on dead organic matter as a saprophite. In a subclassification of microorganisms it is known as a faculative aerobic parasite. By this is meant that ordinarily it grows in a tissue from which air is excluded but that it may grow in some substances, under certain conditions, in the presence of air.

When the tubercle bacillus grows in the tissues of a human being or of an animal it gives rise to a condition which has forcibly arrested the attention of man because of the suffering, sorrow, and misery which accompany it and follow in its wake. In the early history of medicine this condition was named phthisis and consumption. In more recent times it has been divided into two epochs; the earlier being called tuberculosis and the later consumption. In earlier times, too, the condition was viewed by mankind generally as a providential visitation, the punishment for sin, touching not only the immediate offender but reaching the offspring to the third and fourth generation. Science has demonstrated that it is a mere episode in nature subject to natural laws and absolutely under the control of man's will.

Man is interested in tuberculosis because it is a disease. The same processes and phenomena in other fields of nature give pleasure to man but here they give discomfort and are followed by sorrow and misery, because man himself is the field of operation. The word disease means want of ease. Quite naturally man has given much thought to how to avoid getting tuberculosis and how to get rid of it when it afflicts him. By reason of his superior intelligence, man has always been able to control his organic foes so far as visible objects are concerned, but in his fight against the microorganic world he is confronted with a much more serious problem. Much has been done, however, to throw light upon this newly discovered enemy and already it is demonstrated that man need no longer get tuberculosis and that if he is so unfortunate as to get it he need not die of it. Unfortunately the knowledge which makes this new dispensation possible is still in the hands of a few.

All diseases which are caused by microorganisms are communicable. This is a self-evident proposition. Whatever is living can only come from a parent and phenomena which are due to the growth and development of living organisms cannot arise except by reason of the growth and development of these organisms. There is a difference, however, in the manner in which parasitic microorganisms are conveyed from one person to another. Some are conveyed through the instrumentality of insects, some by means of water, and others by contact, direct or indirect. Some parasites have two kinds of hosts, a major and a minor host; some can reproduce themselves outside of a host; and others always remain dormant when out of the host. Parasites which have two hosts and parasites which can reproduce themselves outside of a host may be conveyed from one person to another over long distances, while parasites which are conveyed by contact can only be conveyed within a limited circumscribed environment. The yellow fever parasite, for instance, is conveyed through the mosquito; the typhoid fever parasite through water; and the tubercle bacillus by contact.

All diseases which are conveyed by contact are termed contagious. Contagious diseases are not necessarily alike, however. There may be a great difference in the intensity of contagion. The acute contagious diseases are much more intensely contagious than the chronic contagious diseases. In principle the contagion of all is the same, but in practice the method differs widely. Smallpox, measles, and scarlet fever, for instance, are contagious in exactly the same sense as tuberculosis, so far as the principle is concerned, that is, they are conveyed by contact, but the intensity of the contagion is so much greater with them than with tuberculosis that practical measures for the prevention of the former would in no sense apply to the latter. Smallpox, measles, and scarlet fever affect the whole body and contagion is rapidly given off from the entire body; tuberculosis is a local disease and contagion is given off from one or two points only. In smallpox, measles, and scarlet fever the matter which carries the microorganisms may be invisible; in tuberculosis it always is gross and easily seen. In smallpox, measles, and scarlet fever places and things soon become intensely contaminated; in tuberculosis it takes a long time to produce such a result. Intimate association, therefore, with a person suffering from smallpox, measles, and scarlet fever without contracting the disease is impossible unless the person thus exposed has an immunity from vaccination or previous attack, while intimate association with a consumptive without contracting the disease is quite feasible.

The contagion of tuberculosis, indeed, is of a kind by itself. It differs somewhat from the contagion of every other disease of which we have knowledge. It is so unique that writers have had some difficulty in finding an epithet descriptive of it. This is the reason why many writers object to calling tuberculosis contagious. Some would have us call it communicable, but this term is too generic. Others have suggested the epithet infectious for it, and this does not fit at all because it has a specific meaning which only applies to such diseases as malaria and yellow fever.

The most striking feature about the communicability of tuberculosis is that it depends almost entirely upon the house. An enclosure of some kind is so necessary for the conveyance of the disease from one person to another that contagion is impracticable without it. It is therefore with good reason that we use the phrase house infection of tuberculosis, when we speak of the practical manner in which the disease is spread in a community. The word infection, of course, is used in the broad sense of conveyance and the word house in the broad sense of an enclosure. The phrase tells pretty nearly the whole story of the communicability of tuberculosis and covers the entire proceeding from the beginning to the end,—garnering the seed, preparing the soil, implantation, rearing the tender plant, nurturing the full-grown shoot, maturing and harvesting.

The house is the depository of the tubercle bacillus outside of its host. Were it not for the house, the tubercle bacillus would soon have to perish from the face of the earth. It could not be preserved. Sunlight, air, and water are its natural enemies. The water dissolves it out of its caché and the sunlight and air destroy it. How long tuberculous matter may remain vital in the open air has not been definitely determined, but all agree that the time is very short. Even when the bacilli in such matter are not killed they are weakened so that they will not readily take root when planted. In the house, on the contrary, tuberculous matter may remain vital for a long time because it becomes dry and the broken-down tissue serves as a caché for the bacilli. Even when the matter becomes finely

pulverized, so that the bacilli no longer have so much protection, it remains vital for a long time because the sun and air cannot get at it.

Ordinarily the tubercle bacillus is dependent upon other microorganisms for its exit from its host. These are the streptococcus and the staphylococcus. They are pus-producing organisms and are very adept at destroying tissue. When they join forces with the tubercle bacillus they kill and soften the tissue which has been invaded by the tubercle bacillus and then nature casts it out. A double purpose is served in this way, the tubercle bacillus is helped out of its host and is given a protective covering toward preservation while out of the host. The broken-down tissue which is thrown out forms the protective covering.

In the transition of the tubercle bacillus from one host to another we have a beautiful illustration of nature's jealous care of every form of life. The tubercle bacillus is a motionless helpless microorganism, which can grow and reproduce itself only under certain conditions, in a definite soil, and which requires during the interim between its exit from one host and its entrance into another, special protection, and, for admission into a new host, special opportunities. These are secured for it indirectly through its toxin and the toxins of its associates. By sensations set up in the nervous system, it lures its victim into the very place where exist the best conditions for the preservation of its species, and the best opportunities of finding a new host. Consumption is the autumn of tuberculosis, the blossom grown into ripe fruit. When it comes on the victim, by reason of his chilliness, malaise, and general feeling of helplessness, seeks shelter in some enclosure and is deluded with the idea that the farther he can get away from sunshine and fresh air the better are his chances of recovery. The house thus becomes the harvest field of the ripe tubercle bacillus and the seed quite naturally falls into the very place which by nature is intended for its depository.

The house also prepares soil for the tubercle bacillus. We have every reason to believe that the bacillus cannot get a foothold in perfectly healthy, normal tissue. It is quite likely, indeed, that primordially the tubercle bacillus was a saprophite only and that its function in the world was to change dead organic matter into inorganic matter. It is easy to conceive how gradually it may have evolved into a parasite by growing on tissue, which while not dead was much debased. At any rate, even at the present time it does not seem to be able to invade tissue until the tissue has been injured in some way either by malnutrition, by traumatism, or through the agency of some other microorganism. Malnutrition is one of the most common predisposing causes of tuberculosis.

The physical life of man and animals is a chemical process. There is a combination of certain elements through the instrumentality of a living cell with evolvement of beings endowed with life. Food, air, and water are the substances used in the process. In proportion as these substances are at hand in proper quantities the being evolved is a healthy one; and in proportion as any of the substances are deficient or defective the being is an unhealthy one. Of the three substances required in this chemical process, air is perhaps the most important, and certainly the most necessary. Life may be maintained for some days without food and water, but for a few minutes only without air. The same is true of health. A person may keep fair health on a stinted supply of food and water for a long time but soon succumbs to a stinted supply of air. This probably is due to the fact that air plays a double rôle in health. It not only carries in oxygen for chemical purposes but it carries out poisonous products of chemical action. It is believed by some that rebreathed air produces soil for the tubercle bacillus more through poisonous products of combustion which are disseminated in the air than by reason of deficiency of oxygen. Probably it does it by both. At any rate, housed human beings and animals are very prone to tuberculosis. Deficiency of oxygen certainly leads to malnutrition. Too much food and too little air not only lead to defective metabolism, but throw upon the organs of the body poisonous products which must be gotten rid of to the detriment of the whole system.

Implantation of the tubercle bacillus is greatly facilitated by the house. For implantation prolonged intimate contact with a person, place or thing which has been intensely contaminated with tuberculous matter is necessary. The mere presence of a few tubercle bacilli is not sufficient. Everybody has some resisting power to tuberculosis and with everyone there is a minimal dose which will give an implantation. No doubt this dose differs with different people, but the resisting power exists to some extent in everyone. Even in inoculation experiments on animals a minimal dose has been found below which injections prove negative. This minimal dose, in a sense, measures the individual's fighting capacity against the disease. So long as the minimal dose is not reached an implantation cannot take place. Frequent warfare against a dose below the minimal dose increases the resisting power of an individual and raises the minimal dose. With animals the minimal dose which can give an implantation gradually can be increased until almost complete immunity has been established.

Experiments upon animals have been made by inoculation. It is quite probable that by the natural mode of entrance of the tubercle bacillus into the system the minimal dose is larger than by inoculation. The natural mode of entrance is by the alimentary canal or the respiratory tract. At both of these ports of entry there is strong opposition to admission. The gastric juice has some germicidal powers and all

along the respiratory tract there are devices for keeping out microorganisms. Beyond the ports of entry lie the lymphatics and the lymphatic glands and beyond these the phagocytic bodies of the blood, all of which wage war against microorganisms that may pass the ports of entry. From what has been done experimentally on animals and from what we have been able to observe clinically on man we have good reason to believe that the minimal dose of tubercle bacilli necessary for an implantation by the natural mode of entrance is quite large. This is not a mere speculation either. Out of every five people who are intimately exposed to the contagion of tuberculosis for a long period of time under the most favorable conditions for implantation only one person develops the disease. This shows that implantation is exceedingly difficult even under most favorable circumstances.

An enclosure is the one place in which contamination with tuberculous matter can become sufficiently intense to create an environment capable of overcoming the resisting power of man and producing an implantation. It is only in a house that vital tuberculous matter can accumulate. In the open air, water, sunlight, and air devitalize it nearly as rapidly as it is given off. Tuberculous matter ejected in a house, unless immediately devitalized artificially, dries and is distributed about in particles varying in size from big chunks to impalpable dust. In these particles the bacilli are cachéd and preserved. Gradually all the particles are reduced to dust either by trituration, oxidation, or the action of saprophites. This tubercle-laden dust settles on the walls, on furniture, and on everything in the enclosure. In the course of time there is quite an accumulation of vital tuberculous matter in such an enclosure and every time the air is disturbed tubercle-laden dust is set in motion. Here then finally is an environment capable of giving an implantation of tuberculosis. Occupancy of such a room means constant inhalation and frequent deglutition of tuberculous matter. Tubercle bacilli continuously find their way into the system and it is only a question of time when more have gained entrance than can be successfully withstood by the guards and disease fighters of the body. The result is implantation of tuberculosis.

The kind of house which offers the best environments for implantation of the tubercle bacillus is first the home, and second the workshop. The home, of all places, is the most prolific of new implantations of tuberculosis. It was on this account that in bygone days tuberculosis earned for itself the reputation of being an inherited disease. Tuberculosis is a family disease. It can most easily be implanted around the hearthstone. It follows the family tree in its distribution and when it once gets into a family it follows that family in all directions until it either has exterminated the family or has exhausted the soil and has made what is left of the family immune. The part of the home in which implantations most frequently take place is the bedroom and next to the bedroom, the dining room. The bedroom usually is the place where the victim of tuberculosis spends his last weeks or months, a period during which the disease is most intensely contagious. Among the poor, the dining room often is used as a bunking place for the stricken one until a day or two before death. Under such circumstances the dining room becomes very much contaminated, and becomes a prolific source of new implantation.

The workshop is a very common means of spreading tuberculosis. By workshop, of course, is meant any enclosure in which one or more people are employed. Tuberculosis is an extremely chronic disease and usually runs a long course, even in its contagious form, before its victim is incapaciated for his usual occupation. Some people work with a contagious form of tuberculosis for the greater part of a working lifetime, occasionally being thrown out of employment for a few weeks or months on account of an exacerbation and again returning with as much vigor as before. Unfortunately, habits of men and women in the matter of spitting, make it easy for a consumptive to contaminate his immediate environment in a shop if not the entire shop. One consumptive perhaps cannot contaminate a large shop so as to produce an infectious environment of the entire shop but he can produce an environment around his own stand capable of implanting the disease in one or more of those next to him, and before long he has associates in the task of polluting the shop. In a workshop in which a case of tuberculosis exists careful investigation will reveal the presence of other cases in various stages of the disease. Deaths will occur from such a shop at regular intervals for an indefinite period so long as the shop is permitted to remain contaminated.

Enclosures such as hotels, churches, public halls, places of amusement and public conveyances, in which people stop for a short time only are not apt to give rise to many implantations of tuberculosis for two reasons. First, a consumptive rarely remains in them long enough to produce a contagious environment capable of giving an implantation, and secondly, healthy people seldom remain in them long enough to get an implantation. There is some danger of contracting the disease in such places for people who are employed in them in the capacity of cleaners and caretakers; but for the casual visitor practically there is no danger.

Things which have been intensely contaminated by having been used for a long time by consumptives may give the disease to others when kept or used indoors. In the open air they may be harmless unless worn upon the person. Contaminated furniture, carpet, and hangings of various kinds when taken into a perfectly sterile house may themselves contaminate the house sufficiently to create an environment capable of implanting the disease. The tuberculous matter

adhering to such articles is distributed about and settles on walls and floors. In the open air, on the other hand, tubercle-laden dust from such articles is apt to be dispersed and scattered about over such a wide area as to make it impracticable for any one person to get enough of it to give rise to an implantation.

The house nurtures the tuberculous growth when an implantation has taken place. Mere implantation of the tubercle bacillus does not necessarily mean a development of a full-fledged tuberculosis. The disease always begins in a very small way and attracts practically no attention. The first crop develops and runs through its course and a second follows, perhaps, a little larger than the first. This is followed by a third and a fourth, each a little larger than the preceding one and thereafter another larger still, until finally so much tissue has been invaded and destroyed as to make death inevitable. At any time during the progress of the disease prior to the destruction of tissue essential to normal functions of the body the economy has within itself the power of throwing off the disease. Autopsies prove that this often is accomplished by nature, unaided by medicine. It probably would be accomplished in all cases were it not for the house.

In the beginning of the tuberculous process the tendency to recovery is so great that the slightest aid to nature may turn the tide toward recovery. The process by which recovery takes place probably is healthy metabolism, that is perfect change of food into tissue. Implantation has taken place because the individual temporarily has been a little below par as result of improper food, insufficient air, overwork, dissipation, an attack of some other disease, or some such matter, one or all. Under proper conditions the implantation is rooted up before it can grow into tuberculosis. All that may be needed is a little rest, a little extra food, and a little more fresh air. In some cases recovery might take place if a little rest could be had even without extra food and air; in others, if better food could be had even though no rest could be taken and the air supply could not be changed; but in all recovery would almost surely follow a life in the open air in spite of bad food supply and overwork. Life in the open air enables one to digest coarser food and do more work without fatigue than is possible indoors. This is probably due to the fact that in the open air the poisonous products of combustion are promptly removed from the system and thus are prevented from embarrassing the entire organization. To cure tuberculosis we must have perfect metabolism, and this we only can have when enough fresh air is taken into the system night and day to oxidize the food and cleanse the blood. Imperfect metabolism predisposes to tuberculosis by debasing the tissues and making soil for the tubercle bacillus.

House life undoubtedly plays an important rôle throughout the entire course of tuberculosis to its culmination in consumption and death. With every recurring crop of tubercle the organs of the body become more embarrassed and the economy is less able to carry on the warfare against the disease. When the disease is in the lungs, as it frequently is, the air supply grows less with each destruction of lung tissue. Fortunately nature has given all air-breathing creatures ample lung capacity, enough and to spare, so that a great deal of lung tissue may be destroyed without interfering with the functions of the body, provided the air supply is right. Under these circumstances other organs, no doubt, supplement the lungs in their functions of elimination. Everything hinges upon an ample supply of fresh air, however. When this is at hand healthy metabolism may be attained even when the disease is advanced and through this health may again be reached. Tuberculosis makes its progress because its victim is shut up in a house where he cannot get fresh air. Unfortunately for the poor an ample supply of fresh air is impossible. Their houses, their homes as well as their workshops, have been constructed on a mistaken idea that whatever shuts out air, heat, and cold is conducive to health. The large death rate from consumption really must be ascribed in a great measure to bad ventilation in home and workshop.

The last scene of conflict between the victim and his foe is the house. Tuberculosis develops into consumption because of the house. This does not mean that people could not get tuberculosis if they lived out of doors, for birds of the air and animals of the field get the disease. Tuberculosis, however, in itself would seldom prove fatal. Both animals and human beings may go through life with tuberculosis and reach old age without being seriously inconvenienced by it. Many animals and people do. Dr. Trudeau has shown by experiments on animals that life in the open air greatly retards the development of tuberculosis and promotes recovery. Rabbits which he inoculated and penned up died, while rabbits which he inoculated and permitted to run at large maintained good health, although they developed tuberculosis. In sanatoria where consumptives are made to live out of doors, wonderful improvement sets in even when the case is incurable. Frequently all the symptoms of consumption disappear and the patient becomes comfortable even when so much tissue has been destroyed that recovery is physically impossible. In other words even consumption in the open air loses all its most serious symptoms. The house makes and maintains consumption, and consumption kills.

Consumption may well be termed a house disease. Without the house it would not exist. It depends upon the house for its implantation, propagation and for evolution of all its phenomena. The house is the place where the tubercle bacillus lies dormant in wait for its new

host; it is the place where the new host gets his implantation; it is the place where the tuberculous subject gradually becomes a consumptive; and it is the place where the consumptive dies.

In studying the progress of civilization in the light of modern science one is struck with the egregious blunders into which man has been led by his desire for privacy and comfort. He has built his house to keep out his enemies, to protect himself from heat and cold and to screen himself from the curiosity of his neighbor. He has sought to make his home his castle but in reality he has made it the place wherein he courts death.

If man desires to free himself from the great white plague he will have to retrace his steps from some of what he considers advanced points of civilization. He will have to learn among other things that fresh air is God's greatest gift on earth and that whatever shuts out fresh air, shuts out health and happiness. In house infection he will find the key to the entire problem of stamping out tuberculosis.

CASE OF TETANY.*

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THE patient is eleven months old, the second child of healthy parents, who do not at present and have not at any time suffered from any nervous trouble. The child was fed on mixed food, that is, in addition to the mother's milk she received cow's milk and, occasionally, food from the table. Patient had not as yet had any exanthematous disease, but contracted pertussis when two weeks old, which lasted until her sixth month. The child did not suffer in general health during that time. In the month of July she had diarrhea for a few days from which she made a complete recovery. The present illness began suddenly on September 15. The mother put the child to bed on the previous evening at the usual hour. She told me that before going to bed it was lively and playful, more so than usual, and slept the entire night without waking: in the morning when the mother looked at the child she noticed that it woke up with a start, its eyes became fixed and staring, and after a few seconds it began to cry. When the mother stepped to take the child in her arms, she noticed that it was rigid, "like a stick." A next door neighbor pronounced the child well: "She is only teething." Toward the evening, as the child grew worse, I was called in "to cut the baby's teeth."

I found the infant stretched out on a pillow, unable to move, and crying at the approach of any one, apparently afraid of being touched. Examination elicited the usual symptoms of tetany, which, in the main, are muscular rigidity and contractures, affecting first the upper and then the lower extremities. The fingers were flexed at the metacarpophalangeal joints. The phalangeal joints were extended, the thumb adducted and extended, and the hollow of the palm deepened; the wrist flexed to almost an acute angle, the elbow-joints rigid and flexed, the shoulder-joints, however, were not involved. Next to the hands the feet are the parts most often affected, as was the condition in this case. The thighs were adducted, there was in this case extreme extension of the ankle-joints, and the toes were flexed so that the plantar surfaces were more arched and deeper than in a normal state. The knee-joints were rigid but the hips were not involved. Pulse and respiration were rapid and temperature 102° F. It is characteristic of the disease that it is always bilateral, with symmetrical contractions, some time of variable intensity on either side.

Trousseau's sign, which is a constant pathognomonic symptom of the disease, may be elicited in the following manner: when an elastic band is applied around the arm thereby compressing the blood vessels and nerves supplying the parts, the hand will at once pass into a tetanic state. This is not due to mechanical pressure alone for the other side will also exhibit the same phenomena. The muscles of the face respond to mechanical irritation very readily. The etiology is obscure, age given by some authors as from six months to two years. Dr. Sachs, of New York, who made an extensive review of the literature of the entire subject, declares this affection as most frequent at the ages of sixteen and thirty-five years. Boys are more often affected than girls. Gastro-intestinal disorders seem to be the main etiological factors in the recorded cases, but in the present one the tetany seems to have been the symptom ushering in an acute bronchitis, which lasted four days and from which she made a complete recovery. Another case seen by me, where tetany was the ushering in symptom of lobar pneumonia, was in a child of eighteen months that died subsequently on the eighth day of the disease.

I would reasonably assume from the above two cases that tetany is not always a complication, as some authorities claim it to be, but that it may be the initial symptom of any of the acute febrile diseases, just as convulsions occur at the beginning of many ailments. It may also be a complication of the many exhaustive diseases, such as typhoid, summer diarrhea or bronchopneumonia. The treatment is purely symptomatic. If the cause is discovered such as intestinal toxemia, or tapeworm, it should be removed, if possible, by proper medication. For the rigidity, I know of nothing better than a warm bath.

Pain is relieved by applying cold to the joints involved and the internal administration of the bromides and antipyrin. In the usual case this is all that can be done. In those rare instances, however, where the respiratory muscles are affected, and life is threatened from asphyxia, chloroform inhalations should be given.

* Read before the Eastern Medical Society, September 7, 1903.

203 East Broadway.

TWO CASES OF SEVERE X-RAY NECROSIS, PRESENTING SOME UNUSUAL FEATURES.*

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DURING the past two years our attention has been forcibly attracted, and more or less exclusively occupied, by the gross, general, therapeutical influences of the X-ray. The present time, however, is bringing with it a demand for special knowledge concerning these influences, and their evolution, modus operandi and detail, constitute fruitful fields for future research. Clinical observation will designate the problems; physiology, pathology and physics must solve them. The cases following suggest some queries and food for thought in this connection.

Case I.—The first was observed upon a woman fifty years old, of the brunette type, who was under X-ray treatment for pseudoleucemia accompanied by a large accumulation of fluid in the abdomen. The glandular enlargements were very prominent in the abdominal cavity particularly on the left side, and in the cervical, axillary and inguinal regions. The X-ray applications were all made to the abdomen, the tube focused about two inches to the left of the median line, but so arranged that all of the regions affected received some of the radiance. No shields were used except over the face and only a thin towel was interposed between the skin and the source of light. The tubes used were of the German type with divided anodes, forced back a spark of from four to eight inches, and produced rays of high penetration; distance of anode from patient's skin, ten inches; time of exposure, fifteen minutes; exciting apparatus, twelve revolving 32-inch plate Morton-Wimshurst-Holtz influence machine for the first three months, and a sixteen revolving 32-inch plate machine of the same type thereafter.

From July 26, 1902 to December 4, 1902, she received 50 X-ray treatments, being an average of one every 2.6 days. From December 4, 1902 to April 3, 1903, she received 25 treatments, an average of one every 4.7 days, or about half as frequently as during the preceding period. At this time her disease had improved to such an extent that it was considered safe to interrupt the treatment for a while, which was done. During the period that she was under the above-described treatment the skin over the exposed region of the abdomen had repeatedly become heavily pigmented and peeled off exposing healthy pink skin underneath. Twice there appeared a slight erythema with itching and burning, which subsided completely in five or six days upon suspending the applications. As far as the effect of the X-ray was concerned everything seemed to have eventuated most happily up to that time.

I was asked to see her again April 30, and found her suffering severely with sharp cutting pains in the anterior abdominal wall and streaking up under the ribs nearly to the shoulders on both sides. The skin of the abdomen had been darkly pigmented but now a dusky redness showed through the brown, over an area of about six inches in the vertical by ten in the lateral diameters, and a very intense burning sensation was torturing the patient constantly. Various ointments and lotions were applied without securing relief, and it became necessary to resort to morphine in a day or two. The condition progressed from bad to worse, until May 13, at which time an area four inches in the vertical by eight in the lateral diameters presented the typical picture of white gangrene, the dead tissue being yellowish-white in color, of a tough and leathery consistence with the characteristic gangrenous odor. Severe shooting pains were present almost constantly and manipulation of the parts provoked paroxysms of the same lasting for several minutes. Pulse ran from 105 to 115 beats per minute, the temperature varied from 100° to 102° F. and the patient was unable to leave her bed because of the severe general prostration. Her appetite was excellent and continued so throughout the entire course of the illness.

From this time on the dressing consisted of irrigation with normal saline solution followed by a 10 per cent. aristol and lanolin ointment twice daily. At this time also the edges of the slough began to separate and this process progressed steadily until June 9, when it was completed by the exfoliation of the central mass which was three-quarters of an inch thick by actual measurement. Synchronously with the completion of the sloughing process was observed cessation of the sharp, shooting pains, and they did not recur. The edges of the ulcer had begun to heal as soon as the separation of the slough commenced but this process was very sluggish and unsatisfactory and on July 9, 1903, I commenced using the direct electrical current, negative polarity, 75 volts and 5 to 10 milliampères for ten minutes, applied through a bare metal electrode in direct contact with the ulcerating surface, three times weekly. This hastened the healing process very noticeably and the ulcer was completely covered with healthy skin by October 1, 1903.

By the middle of July the epithelial layers of skin covering the apparently healthy areas contiguous to the ulceration and which had been deeply tanned by the rays, had peeled off entirely, leaving exposed newly formed, epithelial layers, pink, soft, and entirely normal in appearance. Two weeks later this tissue had become pigmented and by the middle of September it was as deeply browned as was that which had exfoliated. At this time there was also observed, scattered over this newly-formed cuticle, 25 to 30

* Read at the Fourth Annual Convention of the American Roentgen Ray Society, at Philadelphia, Pa., December 9 and 10, 1903.

wartlike excrescences, varying in size from a mere point to five or six times as large as a pin head. In this connection I should like to call your attention to the fact that no exposures to X-rays had taken place for more than five months preceding, and that since the last exposure the epithelium which had borne the brunt of the treatments had completely exfoliated, its place having been taken by newly formed tissue, apparently unmodified in structure.

Early in September, or five months after the last X-ray treatment had been given, the skin began to break down at a point three inches to the left of the median line and the same distance above the superior border of the original area of ulceration, and spread over an area of three by five inches during the next month. This area became one of typical white gangrene almost at once but did not extend more than one-third of an inch in depth. The management used upon this spot consisted of saline irrigation twice daily, followed by dusting with a powder consisting of equal parts of anesthesine and talc, which controlled the pain perfectly. About half of the slough has now completely separated, leaving a healthy granulating surface, which is slowly healing. I shall apply the direct electrical current for its accelerating influence upon the reparative process as soon as the rest of the necrotic tissue has exfoliated.

The noticeable features about this case are as follow: (1) The depth to which the original necrotic process extended; (2) the "tanning" and excessive proliferation in spots, of the epithelium of the new skin that was exposed by the peeling of that which had been browned directly by the ray, which new epithelium had not been exposed to the ray and was apparently entirely normal in color and structure when it first developed; (3) the cessation of the pain as soon as the necrotic tissue had completely separated; (4) the favorable effect of the galvanic current in hastening the healing process after the necrotic tissue had sloughed off; (5) the appearance of an area of necrosis five months after the last X-ray application, in a region which had prevously exhibited no evidences that such injury had been inflcted; (6) the happy effect of the anesthesine and talc mixture in relieving the pain of this last mentioned ulceration.

Case II.—The second patient, a medium blonde with gray eyes and dark brown hair, aged forty-nine years, came to me for X-ray applications to an inoperable malignant process in the neighborhood of the left broad ligament accompanied by marked ascites, on January 27, 1902. From that date until April 4, 1903, she received 115 X-ray treatments, an average of one every 3.7 days. The technic was the same as had been used in connection with Case I, except that the twelve-plate static machine was used upon this patient for the first nine months. At this time her condition as regards improvement was such that it was considered safe to discontinue the treatment tentatively. While undergoing the treatment the skin over the exposed region had repeatedly become heavily pigmented and peeled off exposing underneath, soft, pink, new skin. Three times there had obtained slight erythema with itching and burning which had subsided kindly upon suspension of the treatments. When the final treatment was given on April 4, 1903, the skin was deeply tanned and felt to the touch dry and brawny, and this latter characteristic seemed to extend for some distance into the subcutaneous tissues.

There was nothing apparent in the condition to indicate that a dermatitis was about to manifest itself, not even an erythema, but there was present at this time a phenomenon that I had never before observed in this connection, consisting of a subcutaneous effusion of blood about as large as a nickel five-cent piece, two inches to the right of the median line and about an inch above the level of the pubis. This area was slightly depressed below the level of the surrounding tissue, was slightly sensitive to the touch, and had developed suddenly two or three days before.

The spot became more and more sensitive. In a few days sharp pains appeared in this region and streaking upward to the ribs, which increased in severity until by May 1 they had become pretty constant and so severe that the internal administration of opiates was demanded, and the area defined by the subcutaneous effusion of blood had become gangrenous. The body temperature ranged from 99.5° to 101° F. and pulse from 95 to 105 beats per minute. The necrotic area gradually increased in size until by the middle of May it was as large as a silver dollar. At this time another hemorrhagic effusion as large as a silver quarter of a dollar appeared on the left side of the median line which became necrotic about the first of June. By the first of July these areas had coalesced at their lower borders through an isthmus three-quarters of an inch in width, the necrosis having been preceded by little scattered subcutaneous effusions of blood as had been the case with the other lesions. The affected regions were covered by the same tough, malodorous, yellowish, fibrous tissue described in connection with Case I, and had at this time reached their maximum size, consisting of a circular spot on the left side two inches in diameter, and on the right side an irregular spot two inches in the vertical and three in the lateral diameters. As I have just stated these areas were connected at their lower borders by an isthmus of necrotic tissue three-quarters of an inch in breadth, which dimension subsequently increased to one and one-half inches.

By this time the epithelial layer of the skin covering the adjacent, apparently uninjured regions and which had been deeply tanned by the rays, had exfoliated and the newly formed tissue which took its place was normal, soft, and pink in structure and appearance. In a few days, although no exposure to X-rays had taken place, it became

harsh, dry, and profoundly erythematous with considerable itching, but showed no fresh pigment deposits, and has remained in that condition ever since.

The long-continued severe pain had greatly impaired the patient's general condition and she was admitted to the sanitarium, where she could be more efficiently treated, on July 8, 1903. To make a long story short, we ran through the list of pain-relieving applications, including the anesthesine and talc mixture, which, by the way, made the pain worse in this case, and none gave any satisfaction except the ice-cap placed over the ulceration, and an ointment consisting of lanolin with enough olive oil to soften it and ten per cent. of powdered opium. The application of this twice daily preceded by saline irrigation was the management finally adopted.

I used the galvanic current as with Case I, in the hope that it would hasten separation of the necrotic tissue but without result, and the necessary manipulation of the parts was so painful to the patient that the procedure was finally abandoned.

The sloughing of the necrotic tissue progressed very slowly and was not complete until early in October, but the disappearance of the last fragment was accompanied as in Case I, by the disappearance of the severe pains. The necrosis extended to the depth of about three-eighths of an inch and a healthy granulating surface was left which is healing very satisfactorily under applications of the direct electrical current, as described in connection with Case I, which I began using five weeks ago.

Early in October, or six months after the last X-ray treatment had been given, there appeared another slight subcutaneous hemorrhage the size of a dime, three inches to the left of the median line and two inches above the upper border of the original ulceration. Ten days after, the characteristic necrosis appeared which sloughed in two weeks, and the resulting ulceration was almost completely covered by healthy skin by the last of November. None of the severe pains accompanying the development of the other necrotic foci obtained with this one.

The noteworthy features about this case were as follow: (1) The constant appearance of a subcutaneous effusion of blood in the areas which subsequently became necrotic; (2) the spontaneous development of profound erythema and structural modification in the newly formed skin exposed by the exfoliation of that which had been browned by the direct agency of the rays; (3) the cessation of pain as soon as the necrotic tissue had completely separated, a feature also exhibited by Case I; (4) the apparent failure of the direct electrical current to accelerate the separation of the necrotic tissue, and its gratifying effect upon the reparative process after this tissue had sloughed; (5) the appearance of an area of necrosis six months after the last X-ray application, in a region which had previously exhibited no evidence that such injury had been inflicted; a feature also obtained in Case I; (6) the aggravation of the pain produced by the anesthesine and talc mixture.

Although neither of these cases presents a finally completed history, what has been observed to date is sufficient to shed some additional significant light upon the influences which the X-ray experts upon the tissues, and the management of the untoward results of these influences.

First, the belief, somewhat extensively held, that a patient who "tans" well need not fear a burn, is demonstrated by these cases to be untenable. Both of these patients tanned readily and profoundly.

Second, the "tanning" and excessive epithelial proliferation of the new skin observed in Case I, and the profound erythema and structural changes of the new skin observed in Case II, all of which modifications obtained in tissues which had developed months after exposures to the rays had ceased, indicate that the physiological action of X-light is not confined to stimulant or destructive influence upon tissues that already exist, but that it is capable of modifying most profoundly and more or less permanently, the developmental functions which control cell growth. I have previously expressed a belief in this phase of influence, and that we shall ultimately find that it plays no small part in the beneficial effect exerted by the X-ray upon many cases of malignant growths.

Third, the abrupt cessation of the sharp, cutting pains simultaneously with the final separation of the necrotic tissue, would point to direct irritation by the sloughing mass, of the distal ends of nerve trunks supplying the affected parts as their exciting cause, probably through the development of toxins by retrograde tissue metamorphosis at the line of separation; a pure neuralgia in short, and which would indicate extirpation of the necrotic area by curettement or otherwise as a logical management for X-ray dermatitis of this degree.

Fourth, the accelerating influence of the direct electrical current upon the process of healing after the slough had separated, noted in both cases, is significant from a therapeutical standpoint. The power of the negative pole of the direct electrical current to hasten repair in open sores of various sorts has long been known to electrotherapeutists, but the X-ray ulceration has exhibited a peculiarly intense resistance to all ordinary measures available for this purpose, and the knowledge that we have in this modality an effective curative agent even in this condition constitutes a comfortable thought. It is probable that skin-grafting will be avoidable in many cases where galvanism is available.

Fifth, the appearance of new areas of necrosis, in Case I five months, and in Case II six months, after the last X-ray exposure had been made, admits of three hypotheses in the way of explanation. It might have been due to a cumulative characteristic of the ray, whereby the direct effect of the exposure did not fully develop until after

these lapses of time; it may have been due to a modifying influence exerted by the ray upon the developmental functions of the cells involved, whereby the younger generations of cells were unable to acquire the degree of vitality necessary for the maintenance of tissue integrity; or it may have been the indirect result of circulatory insufficiency caused by an X-ray endarteritis obliterans which had required this length of time for its full development. None of these are entirely satisfactory, however, and we shall have to await the acquisition of a fuller knowledge of the modus operandi of X-ray effects, before we can decisively account for this, and many other of its vagaries.

Sixth, the sedative effect of anesthesine upon the pain in Case I, and its aggravating influence in Case II, illustrates the statement frequently made and the truth of which is now pretty generally admitted, that no two cases of X-ray pain can be depended upon to react uniformly to the same palliative agents. In no other condition does there obtain so emphatic an exemplification of the old adage that "What's one man's meat is another man's poison." Each case must be treated according to its own individual peculiarities, and usually the only way to ascertain the peculiarities is to begin at one end of the list of therapeutical agencies and apply them successively until we find one that is effective.

Seventh, the sudden and constant appearance of subcutaneous hemorrhage preceding the development of necrosis noted in Case II, is worthy of record, but I do not at present comprehend its significance, nor can I offer a satisfactory explanation.

In conclusion, the histories to date of these two cases, constitute a warning against exposing a patient to the X-rays with even a moderate degree of frequency through long periods of time, no matter how well they seem to bear them at first. There are few conditions so pregnant with torture for the victim as a deep X-ray dermatitis, and the risk of precipitating such a disaster is only justifiable in cases presenting an absolutely hopeless prognosis under other methods of treatment.

THE VALUE OF VAGINAL CÆSAREAN SECTION: WITH REPORT OF TWO CASES.*

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TO DÜHRSSEN of Berlin the credit is due for having introduced this valuable method into practise. No matter what others may have done before him he has laid down the rules and indications for the operation and given them the widest circulation. It was only through his writings, about four years ago, that I became acquainted with them and was struck by the efficiency of his method in a case of uterine cancer at four months' pregnancy. I could at that time comprehend that it was destined to take the place of ventral Cæsarean section in nearly every case where the soft parts formed the obstacle to delivery or where a narrow pelvis could be excluded. The clinical reports of operations undertaken upon various indications seem to speak favorably of this method.

Dührssen first advised the operation in the *Allgemeine deutsche Aerztezeitung*, April 1, 1895, Nos. 7 and 8, where he spoke of the treatment of eclampsia. He said that in convulsions during pregnancy it was important to empty the uterus as quick as possible and this could be done by competent hands through an incision of the anterior wall of the cervix and lower segment of the uterus. Again at a meeting of the Obstetrical Society of Berlin, January 10, 1896, he said, "The vaginal Cæsarean section, according to my view, can only be done at a clinic and with trained assistance and it is indicated where a closed and undilatable cervix endangers the life of the mother and, in rare cases, that of the child." He then gave a description of his method of operating, which he had followed in a case April 24, 1896, at the normal end of pregnancy on a patient upon whom vaginofixation was performed some years before. The large size and transverse position of the child caused him some fear of serious trouble. In this case he made a longitudinal incision through the anterior and posterior uterine wall up to the internal os and drained the uterus by a tampon. On May 29, 1896, he presented the mother and child before the German Surgical Society and gave the following indications for vaginal Cæsarean section:

1. Abnormal conditions of the cervix and lower segment of the uterus (carcinoma, myoma, rigidity, stenosis of the cervix and partial pouch-like distention of the lower uterine portion).

2. Dangerous conditions of the mother, which may be removed or relieved by prompt emptying of the uterus—affections of the heart, lungs and kidneys.

3. Conditions of the mother where death is imminent and can be foreseen. The last two indications have only value in cases where the cervix is closed and not dilatable or where the depressing influence of labor pain should be obviated as in affections of the heart and lungs. In pregnancy complicated with cancer of the uterus he advocated immediate vaginal section with subsequent extirpation of the uterus, no matter at what time of pregnancy or at what stage of labor this condition is encountered. His mode of procedure consists in curetting and cauterizing the carcinomatous tissue with thermocautery, then he ligates the basis of the parametrium on each side, the vagina is then separated from the uterine portion on all sides and, if necessary, the opening can be enlarged by an anterior longitudinal incision. The uterus is pulled down with tenaculum forceps and a rapid median incision is made in the anterior and posterior wall of the uterus sufficiently large to extract the child. After the placenta has been removed the uterus is

* Read at the meeting of the Association of American Obstetricians and Gynecologists, Sept. 23, 1903, at Chicago.

split further up and the anterior and posterior cul-de-sac opened so that the uterus can be grasped higher up with forceps and pulled down to tie or clamp the ligaments from above. The suturing of the peritoneum ends the operation.

His second case was a moribund woman suffering from mitral insufficiency and dilatation of both ventricles with a high degree of compensatory disturbance, very feeble pulse, orthopnea, cyanosis and extensive edema. The child was slightly asphyxiated, the operation lasted only about twenty minutes, but the condition of the patient was such that she could not endure the operation.

His third case, one of eclampsia, was reported in the *Centralblatt für Gynäkologie*, No. 2, 1901, p. 54. Patient was in her sixth month of pregnancy, she died about twenty-three days after operation with symptoms of pulmonary tuberculosis and pneumonia, with a return of edema and albuminous urine. As the pelvic organs had recovered their normal condition he is justified in mentioning this case in his statistics as cured. He expressed the hope that he may see the time when the classical Cæsarean section will be replaced by the vaginal section in grave cases of eclampsia and advocates the latter method where the soft parts form a serious obstacle to labor and the life of the mother or child is in danger, provided the cervix is closed or undilatable. In his monograph: "Der vaginale Kaiserschnitt," 1896, he had already specified the indications for this operation plainly and comprehensively and thought that besides cancer of the uterus and eclampsia, uremia and premature detachment of the placenta with internal hemorrhage might call for it when the cervix is closed and there is absence of pain. Retroflexion, pouch-like distention or kinking of the gravid uterus might also furnish an indication. He also claims that with such an operation, under deep anesthesia, 93.75 per cent are saved in eclampsia, on the other hand 78.9 per cent. if left to spontaneous delivery.

Simon, of Nürnberg (*Münch. med. Wochenschrift*, No. 21, 1903), reports three cases of vaginal Cæsarean section. One case was operated on two years before for prolapse of the vagina and uterus where anterior and posterior colporrhaphy with amputation of the cervix was made. The resulting condition, stenosis of the uterus and vagina, complicated the act of confinement very much. Although the pains began three days before and the water had broken at that time very little progress was made. The cicatricial stenosis of the os and vagina proved too great an obstacle for spontaneous delivery. After having made an incision through the perineum and posterior vaginal wall he made a saggital incision in the anterior vaginal wall to the os uteri. As the cervix had been amputated before there was some difficulty in hooking down the uterus. Close to the cicatricial border he separated the vagina from the uterus by a transverse incision and after having pushed the bladder up from the uterus he made a median incision of 10 c.m. into the uterine wall which enabled him to grasp the head of the child with forceps and promptly deliver a living child weighing eight pounds. The placenta followed soon, he then stitched the uterus up with eight deep silk sutures, the vagina with catgut and the perineum with silk sutures. Patient recovered fully and had no return of the prolapse.

The second case, a primipara, thirty years old, had labor pains for five days, water broke at the start. The os opened the first two days to admit two fingers and remained in that condition, though the pains continued. They gradually became spasmodic, fever set in and patient became exhausted. The doctor found the head in the pelvis pushing the cervix before it, but the latter would only admit two fingers. He was unable to assign any cause for such a condition, unless it was the rigidity which is at times met in older primiparæ. As there were signs of a living child he concluded to make a vaginal Cæsarean section. The pelvis was normal, tetanic contractions of the uterus, pulse very rapid and general condition feeble and exhausted. The child was extracted with forceps after having made an incision into the perineum and anterior portion of the cervix and uterus. The mother died three days later, but the child is living.

The third case, a primipara, twenty-four years old, at the end of pregnancy, had eight convulsions without any sign of pain and was in a comatose condition. He made dilatation with metreurynter, which caused slight pains, but increased convulsions; two hours later he made vaginal section. The cord was prolapsed and pulseless, perforation of the head in this instance was considered the simpler way. Convulsions ceased, but coma lasted two days. Recovery of mother. As I have mentioned before, Dührssen said that premature detachment of the placenta might also furnish an indication for vaginal Cæsarean section. This soon found its practical application in a case reported by Rühl (*Centralblatt für Gynäkologie*, No. 47, 1901). Patient received a slight trauma to her abdomen the day previous. The following forenoon she had a few slight pains, followed suddenly by a very severe one, as if something had ruptured inside, a moderate amount of blood was found in the vagina. Patient became unconscious and fell to the floor. One hour later Dr. Rühl found the fundus uteri near the right border of the ribs; configuration of the womb was apparently normal, the right side of the corpus uteri, however, was more prominent. The fetal parts could not be felt distinctly, there were no movements and the heart beats were also extinguished. The vagina was filled with blood clots, the cervix not obliterated, its walls were thickened and hard, the index finger could hardly be introduced, the membranes were intact and became tense during the pains, the placenta could not be felt near the os uteri. Patient regained consciousness and stated that

her pains became harder. There was a constant trickling of blood and especially so during labor pains. Rühl introduced a colpeurynter to dilate the os, but about fifteen minutes later patient became unconscious again and deathly pale, the corpus and fundus uteri formed a projecting tumor of the size of a man's head, with a distinct elongated swelling pointing toward the cervix. This led the doctor to the conclusion that there was internal hemorrhage calling for immediate operation. Patient received saline infusions and the anterior and posterior walls of the cervix were incised, which caused no great hemorrhage. The time from the incision to the extraction of the child occupied six minutes. The placenta and large blood clots followed spontaneously; hemorrhage ceased immediately after the uterus was emptied. Patient was in a precarious condition for about twenty hours, repeated saline infusions and injections of camphorated oil produced a change for the better. Rühl thinks that the classical Cæsarean section might present less technical difficulty in the hands of a surgeon not skilled in vaginal operations.

Another interesting case was recently reported by Rühl (*Centralblatt für Gynäkologie*, No. 34, 1903), under the heading "Hysterotomia anterior vaginalis owing to intense rigidity of the cervix, complicated by a tear in the lower uterine segment and parametrium. Patient, twenty-five years old, primipara, had been in labor five days before he saw her. She was extremely feeble, pulse 120 per minute, temperature, 37.8° C. She had constant pains, uterine walls were very tense and sensitive on touch, contraction ring distinct about three fingers width below the umbilicus. External genitals were not more developed than those of a girl, twelve to thirteen years old and exhibited no sign of pregnancy such as swelling, softening or discoloration. Pelvis, somewhat narrow, was funnel shaped, vagina would admit two fingers. Head was down in the pelvis pushing the lower uterine segment before it. Cervix could hardly be reached, it was high up and far back in the pelvis, hard and not dilated at all, the external os was completely closed. The water had broken five days ago and there were tetanic contractions of the uterus. As there was danger of rupture of the uterus he thought immediate delivery was indicated. There was some difficulty in bringing down the cervix and an effort to dilate it with instruments succeeded only so far as to admit one finger. He, therefore, made an anterior incision and delivered a living child by forceps. In spite of all care and multiple incisions into the vagina he tore the latter in two places and had also a perineal tear into the rectum. The hemorrhage was so severe that patient collapsed in one-half minute and, though the placenta was immediately removed and the uterus had contracted, the bleeding still kept up. The cause of the latter was found in a tear which started from the highest point of the anterior incision in a transverse direction to the left side and lower part of the parametrium. These parts were immediately grasped by forceps and, after a squirting artery was ligated, they were united by sutures which checked the hemorrhage completely. The anterior incision and vaginal and perineal tears were also united and patient made a nice recovery.

Bumm was also able to report in *Centralblatt für Gynäkologie*, No. 52, 1902, 13 cases of his own with one death of the mother due to coma in eclampsia. The indications for his operations were cancer of the uterus in two cases, eclampsia in five cases at the seventh, eighth and ninth months of pregnancy. One case of nephritis at the ninth month, another case of nephritis complicated with mitral stenosis and insufficiency was operated on in her sixth month of pregnancy under local anesthesia and greatly improved after this. One case of severe chorea, operated on in her fifth month, was delivered of twins and relieved of her chorea in about one week. One case was operated on for hemorrhage in her sixth month of pregnancy, which was due to vicious insertion of the placenta. In two cases of flat, rachitic pelvis artificial induction of labor was resorted to. Braun-Fernwald (*Wiener med. Wochenschrift*, No. 28, 1898) made the operation on account of stenosis of the cervix and vagina, he made anterior and posterior incisions. Ehrendörfer reports a case (*Centralblatt für Gynäkologie*, No. 16, 1903) where hyperemesis gravidarum formed the indication for operation at six months' pregnancy. The vomiting and salivation gradually ceased after one and a half days and she made a nice recovery. Spinelli operated on a case in 1898 for cicatricial stenosis and hydramnios with uncontrollable vomiting.

Dührssen reports another case of eclampsia (*Centralblatt für Gynäkologie*, No. 16, 1903). The patient was a primipara, her legs and face began to swell about the end of January. On February 23 her vision became disturbed, she had severe headache and vomited twice a day. On February 26, she had five convulsions, the vagina would only admit two fingers, was rigid and dark blue, cervix not obliterated and would only admit one finger. An incision in the right vaginoperineal region gave sufficient access to his fist. After he had made an anterior incision into the womb he found it necessary to make one also in the posterior portion to admit his hand. After version was made a living child was delivered. Half an hour later the placenta was removed by pressure and as there was some hemorrhage due to uterine atony a gauze tampon was introduced. The posterior incision required four and the anterior five catgut sutures. The vaginal incision was stitched up with continued catgut sutures after having left a small gauze strip for drainage. The urine was free from albumin on March 1, and patient left the hospital in good condition on March 6, 1903.

To the above reported cases I can add one of my own, where I performed vaginal Cæsarean

section for eclampsia. Mrs. J. B., Bellevue, O., about thirty-five years old, had four children. On April 22, 1903, at her seventh month pregnancy, she began to have convulsions at 8 P.M. and had about seven attacks before I saw her the next morning at 9 o'clock with Drs. Richards and Harding. She was comatose since midnight, temperature 101° F., pulse 95, she vomited several times, bowels moved three times. The cervix, not obliterated, admitted the little finger, but an attempt at further dilatation with instrument proved futile or, at least, would have been too slow. Two fatal cases in my practice gave me the conviction that more rapid delivery might have given better results. While we were preparing for the operation, at the home of the patient, she had another convulsion. The posterior portion presented more favorably than the anterior and, owing to the surroundings and scant assistance, I thought I would follow the way which seemed the easiest for me under the circumstances. On that ground I made my deepest incision into the posterior portion (about 4½ inches long) and then a more shallow one into the anterior with the knife. Hemorrhage was not profuse, as I at once introduced my hand into the uterus and made version. There was a little delay in getting the head of the child through the vaginal outlet, but the whole procedure occupied only six minutes, the placenta was removed a few minutes later by pressure and an iodoform gauze tampon introduced into the uterine cavity. The incisions were stitched up with catgut sutures and the whole operation was done in about twenty-five minutes. Patient rallied after several hours, the child lived about one and a half hours. I saw patient about two months later, she was in perfect health, a small portion of the posterior incision had not united, urine was free from albumin.

There was over 60 cases of vaginal Cæsarean section reported so far, the majority of them were undertaken for cancer of the uterus, but the number performed for puerperal convulsions is also increasing rapidly and it seems that this trouble will furnish the chief indication for such an operation in the future. Most authorities seem to agree that rapid delivery is the most important measure to reduce the mortality in eclampsia, I also think that rapid dilatation with Bossi's dilator or similar instruments will be superseded in some measure by an operation where the extent of incision or laceration is more under your control and where the wound gives more promise of healing by primary union. The operative technic consists in exposing the uterine portion by a large speculum or retractors and grasping it by two pairs of forceps on either side of the os. A longitudinal incision of 5 to 7 c.m. is then made in the anterior wall of the vagina down to the os uteri. The loose cellular tissue is then opened with scissors between the bladder and cervix. The bladder is pushed back with a small piece of gauze as far as the internal os and corresponding to that height a saggital incision through the anterior wall of the cervix is added. The upper margins of the wound are again grasped by forceps in a manner similar to morcellement and vaginal myomotomy. This exposes a further portion of the womb, the bladder is pushed up more and another incision is made through the lower segment of the uterus. If this maneuver is repeated a few times an incision of 8 to 12 c.m. can readily be made under the guidance of the eye and without opening the peritoneum. This incision is generally large enough to admit the hand and to extract a mature child. Should it, however, not be sufficient a similar procedure can be followed at the posterior portion. In the majority of cases it is probably best to wait for the natural expulsion of the placenta or, if it does not follow soon some pressure upon the uterus can be used. This operation is no doubt best done at a hospital, but it can, in case of necessity, also be done at the patient's home, as my case proves. As a rule the incision in the anterior portion is preferable, I could, however, see no especial difference in my case and would in the future be guided by circumstances. These incisions can be closed by catgut sutures or other material. Dührssen recommends uterine tamponade, others again reject it.

Since the writing of this paper, I had the opportunity of operating on a second case of puerperal eclampsia. Mrs. F. S., age twenty-five years, primipara, pregnant eight months, complained of headache for a few days. On September 6 at 4 P.M. she began to have convulsions and had about five before I saw her with Dr. Stierwalt four hours later. The doctor had given her one and a half grain of morphine a short time before. She was in a deep stupor, but could be aroused for a few moments. The head was down in the pelvis pushing before it the anterior portion of the womb, cervix partially obliterated, would admit two fingers. She had no pains; temperature 98.4° F., pulse 114, urine thick with albumin; it was like a boiled egg. As I did not wish to operate by lamplight, if it possibly could be postponed, we concluded to wait till daylight and to give her morphine or chloral in case of necessity. She was brought to the hospital early the next morning and had in all about eight convulsions, was cyanotic, tongue bleeding, dark and covered with crusts, some puffiness about the eyelids. Cervix in the same condition and there were no signs of pains. Operation began about 7 o'clock, anterior incision was made about three inches long, bladder was pushed up further, but as tissues seemed so brittle I thought it best to make also a posterior incision about 4½ inches long, this admitted my hand so that version could be made readily, child was delivered in about seven minutes; it took a few gasps but did not revive. Hemorrhage was not severe, placenta was removed five minutes later by pressure; operation lasted a little over one-half hour. Four catgut sutures united the anterior incision and

six the posterior. There was a shallow tear of the perineum which extended also through the wall of the vagina nearly up to the parametrium, this was united by continued catgut suture. Salt solution and camphorated oil were injected, pulse 110, temperature normal. Consciousness returned somewhat about 6 o'clock P.M. on the day of operation. Esbach's albuminometer showed about 10 grams of albumin (2 per cent.) after an equal quantity of water had been added to the urine, the next day it went down to one-half gram. Patient left the hospital in about three weeks in very good condition and urine was free from albumin.

MEDICAL PROGRESS.

MEDICINE.

Cyclical Albuminuria.—This is a term used by Pavy, to designate certain cases of albuminuria occurring without demonstrable organic disease of the kidneys in individuals otherwise in normal health. A. R. ELLIOTT (Med. Rec., Dec. 12, 1903) has recently followed two cases for some time, which now present conditions which answer all the requirements demanded of this type of case—namely, periodical appearance of albumin in the urine without casts and without any other signs in the body that organic changes have occurred in the kidneys. In both these instances there was an entire absence of albumin in the morning urine, its presence occurring during the middle of the forenoon, reaching its height about three o'clock and then disappearing in the evening. Its presence seemed to depend more upon the standing posture than upon exercise or the diet. In both of these instances, however, there had been unmistakable attacks of mild nephritis in previous years from which the patients had seemingly entirely recovered, with the exception of this periodical discharge of albumin. No doubt, there had been, however, some slight organic changes, which were sufficient to influence the function of the kidneys in this way. The author believes that if these instances of functional albuminuria could be carefully traced back it would be found that in nearly every case some organic change had previously occurred. He would, therefore, suggest that they are, after all, organic in their causation, but that they may never be of sufficient importance to influence the general health.

Spontaneous Cure of Carcinoma.—While disappearance of benign tumors is undoubtedly possible, most authorities are skeptical concerning the spontaneous cure of cancer, though it is generally admitted that theoretically the cancer cells may be so interfered with in their nutrition that they degenerate. Most reported cases, according to H. MOHR (Therap. Monatshft., Nov. and Dec., 1903), were not carcinomatous at all, in others merely a period of latency set in owing perhaps to the removal of the inciting cause, such as an irritating tooth. The surrounding inflammatory reaction will gradually disappear and it actually seems as if the tumor were getting smaller. Yet, in every malignant tumor the body does not permit an unlimited growth of the pathological tissue; on the contrary, it tries to overcome the invasion by connective tissue proliferation and perhaps also by the production of specific cytolysins, and we will never be able to tell how often cancer is checked in its incipiency. Various constitutional derangements exercise an inhibitory influence, then a cessation of growth is often noted with reduced vitality and debilitating infectious diseases such as sepsis and syphilis. Concerning the influence of other diseases, very little is known, but mild diabetes seems to check and florid diabetes to hasten the growth of cancer. There seems to be a very peculiar relation between the genital organs of women and malignant growths, especially of the breast, and parturition, lactation and the menopause seem to occasionally exert a favorable influence. Beatson's operation is based upon this observation and no doubt does good sometimes. From time to time undoubted cases of pyloric cancer are reported cured after simple gastro-enterostomy; the only possible explanation here is that the removal of all irritating agencies prevented further development. Complete disintegration through necrosis and gangrene is also possible, and erysipelas, while it lacks any specific action, is able to set up so strong a reaction that the leucocytes eventually destroy the tumor cells. In intestinal growths complete ulceration has been observed through the action of intestinal bacteria, though all malignant cells are rarely destroyed. The great drawback against applying this principle in therapy is the danger of general infection. A most promising subject is that of specific cell-poisons, and it may yet be possible to destroy cancer cells by some toxin which does not influence the normal cells of the body.

Postural Albuminuria.—Probably under no conditions can albuminuria ever be physiological. SIR WILLIAM H. BROADBENT (Brit. Med. Jour., Jan. 2, 1904) states that a greater precision in the definition of what we mean by functional albuminuria is necessary. Although this may be admissible in the sense given to it by Dr. Pavy as a contradistinction to structural, it is vague. The albuminuria of the apparently healthy is still more unsatisfactory in designation. It may be said definitely that there is an effection which may be called postural albuminuria. This applies to that small class of cases from which have been eliminated early nephritis and nephritis in process of recovery; early stages of granular kidney; unsuspected heart disease, albuminuria from fever, from overfeeding or indigestion, gout or oxaluria. There is left a group of cases in which the characteristic feature is albuminuria on rising from bed in the morning, usually passing off in the course of the day. This condition is frequently seen in young students, and the designation of albuminuria of adolescence is appropriate, but the term postural albuminuria is better. The albumin is not due to food. It does not appear if the patient remains in bed to breakfast or after meals during the day. It cannot be toxemic; it disappears quickly on lying down. It is obviously in relation with the erect posture and scarcely less obviously with imperfect cardiovascular adjustment to the changed hydrostatic conditions. The amount of albumin is usually small. It is important that the form of albuminuria should be recognized, since the treatment required is the diametric reverse of the liquid diet and rest of ordinary nephritis. A neurotic family history is a common antecedent. The pulse often changes markedly on standing up or lying down. A high tension pulse contraindicates the probability of an existing albuminuria being postural. Another sign is that the second sound is reduplicated when the patient lies down. The prognosis is favorable, cure resulting in almost every case from improved hygienic surroundings. If, however, these cases are put on milk diet, are protected from cold and forbidden to take exercise, they may be converted into helpless and chronic invalids.

Fetal Heart Murmurs in Gravida.—Up to 1897 but three cases of this variety were on record, two of which

were reported by Hochsinger and the third by Christopher, of Chicago. J. N. Hall reported another at that time. During the first week of November a pregnant woman was admitted into the Woman's Hospital in Denver, Colo., and it was during the examination of the heart sounds of the fetus by H. G. WETHERILL (Am. Jour. of Obstet., Jan., 1904), that a murmur was detected, and it was clearly pronounced and made out to be systolic in origin. It was heard two inches below and to the right of the umbilicus of the mother, and was audible over an area of about three inches of the abdominal wall. By external palpation the position of the fetus was found to be L.O.A., and the head lying rather low in the pelvis. The mother was twenty-eight years old, a IV-para and until Oct. 1 had been as well as in her previous pregnancies. The diagnosis of the presence of the systolic murmur was confirmed by examination of the heart of the child when it was born, a month afterward. The murmur was still present when the mother and child left the hospital on November 19.

Rare Form of Persistent Ductus Botalli.—Four forms of persistent communication between the aorta and pulmonary artery are recognized by O. WAGENER (Deutsch. Arch. f. klin. Med., Vol. 79, Nos. 1 and 2): (1) Extreme shortness of the canal, so that there is merely a deficiency in the walls of both vessels; (2) funnel-shaped structure, the wide end of the funnel corresponding to the aorta; (3) cylindrical shape of varying length; (4) aneurysmal dilatations. These may rupture during birth and cause sudden death. At an autopsy, another rare condition was found: the canal was open in its entire length except at the pulmonic end, where a delicate membrane prevented the admixture of systemic with pulmonic blood. It was impossible to say if this membrane had formed in later life, but the observation is of value, since it would explain certain cases where the symptoms of open duct disappear as the patient gets older. The cure need not, however, be permanent, as the membrane is so delicate that it may readily rupture. A narrow communication frequently gives no symptoms, which accounts for the fact that the condition is so rarely diagnosed during life.

Vocal Cords in Double Recurrent Paralysis.—It is a well-known fact that in double recurrent paralysis, a forced adduction of both vocal cords is often noticed with every inspiration which closely presses the cords together. F. SINNHUBER (Deutsch. Arch. f. klin. Med., Vol. 79, Nos. 1 and 2) ascribes this phenomenon as observed experimentally to a rarefaction of air beneath the glottis and to the action of the muscle of the neck and pharynx which are brought into play as soon as dyspnea sets in. The adduction disappears after tracheotomy, but persists when the neck muscles are severed. Clinically, however, the rarefaction plays a less important part, since tracheotomy does not overcome the median position of the cords. It is here probably due to the cricathyroid, after fixation of the arytenoid cartilage by means of the lateral cricoarytenoid. The expiratory dilatation would then be due to relaxation of the cricothyroid.

THERAPEUTICS.

Action of Digitalis Upon the Heart.—Most of what is known concerning the direct action of digitalis leaves upon the heart, is based upon observations on the excised organ of the frog, for it has hitherto been impossible to keep the more delicate mammalian heart at so even a temperature and to introduce the circulating fluid with so uniform a pressure, that extraneous influences are entirely excluded. Since digitalis most likely influences frogs differently than man in that slowing of the pulse in the latter is solely due to irritation of the vagus center, while in the former, peripheral stimulation will also lead to bradycardia. R. GOTTLIEB and R. MAGNUS (Arch. f. exp. Path. u. Pharmak., Vol. 51, No. 1) have gone over the subject anew, with improved methods. In these experiments cats were bled until respiration ceased; then enough warm normal saline infusion to correspond to the entire amount of blood was injected into the jugular vein and this also removed. The total fluid was defibrinated and diluted to 500 c.cm. To half of this, a certain amount of strophanthin in some experiments, and digitoxin in others, was added; the other half was used as control. The heart was then excised and the fluid injected directly into the coronary arteries. It is absolutely necessary to maintain a temperature which does not vary within a single tenth of a degree and to regulate accurately the rate of flow, else variation in the beat will occur even in the control experiments. Registration by means of the graphic method was accomplished by inserting a small lever into the apex of the heart and by means of a small rubber bag in the ventricles which recorded all variations of pressure on a tambour. The result of the experiments is as follows: During the first fifteen minutes, the contractions increase considerably in number. Both ventricles participate in this, and slowing of the pulse from the beginning is very exceptional. In most cases the systole is shortened in this stage, the diastole lengthened and the actual height of the contraction increased. Considerably later, the contractions diminish in frequency; finally the heart stops in systole or the beats become very irregular. The relaxation during diastole will become less and less marked and even when pulsations are no longer recorded, the spasm may increase so that the heart finally feels very hard. If the pressure of the circulating fluid be increased, a heart which is spastically contracted, may again begin to beat, an observation which had already been made on the frog's heart and which is due to an increase in intracardial pressure. Where the heart's action is irregular, digitoxin will render it regular. Further experiments were made upon the actual work the heart does when under the influence of digitalis and there was found to be a marked increase in the output of energy with every contraction, so that 2½ to 3½ times more work is done than normally.

Action of Alcohol and Metals Upon the Sea Urchin.—The addition of even a small amount of alcohol to sea-water containing very young fertilized eggs of the sea urchin seems to be very injurious to the development of this animal: cell-division and gastrulation are considerably delayed and the motility of the mesenchyma cells is interfered with so that the skeleton is but incompletely developed and its various branches show atypical arrangement. Older eggs are more resistant and the concentration must be increased considerably to have any effect. Concerning the toxicity of various alcohols, I. FÜHNER (Arch. f. exp. Path. u. Pharmak., Vol. 51, No. 1) finds that prophylic alcohol is three to four times more poisonous than ethylic and this again three times more poisonous than methylic. Sugar and urethane possess the same action to a less pronounced degree. The addition of arsenic to sea-water does not influence cell-division or gastrulation, but the invagination of the intestine is delayed. Copper brings about atypical division while mercury, even in very high dilution, kills the eggs immediately.

Action of Drugs on the Coronary Circulation.—The action of the heart stands in intimate relation to its blood-supply and the condition of the coronary ar-

teries. If the blood-pressure rises with more active cardiac contraction, more blood will also pass through the heart-muscle so that the heart will be able to work against increased resistance. The width of the blood-stream within the heart also plays a prominent part in the nutrition of this organ and it is a significant fact that many poisons have an appreciable influence upon the tonus of the coronary vessels. Since it is still impossible to study the mammalian heart in connection with the nervous system, the experiments of O. LOEB (Arch. f. exp. Path. u. Pharmak., Vol. 51, No. 1) concern themselves solely with the peripheral action of drugs. The heart was isolated, blood allowed to circulate through the coronary system under constant pressure and temperature and the amount of blood escaping from the coronary veins into the auricles, carefully measured from minute to minute. In control experiments a slight contraction of the vessels was noticed, that is, the escaping blood became less each minute; this did not, however, interfere, as there never was a sudden rise or fall, such as would be expected upon the addition of an active drug to the circulating fluid. Briefly, the results are as follows: The coronary vessels are not much influenced by strophanthin, while digitoxin contracts them so strongly that only half the amount of blood is allowed to flow through after a few minutes. Caffeine and theobromine increase the frequency and volume of the pulse; the amount of blood discharged by the coronary vein remains the same or is slightly increased. The latter need not depend on dilatation but may be due to the increased heart action; it is more marked with theobromine than with caffeine. Amyl nitrite in a concentration of 0.06-0.2 per cent. does not influence cardiac contraction but leads to the formation of methemaglobin. Larger amounts dilate the vessels, still larger ones reduce the heart's action so that less blood escapes. Since the chief therapeutic action of amyl nitrite is directed toward the central nervous system, these experiments prove little. Ether dilated the vessels and interfered seriously with the heart-beat; chloroform proved so toxic an agent that accurate observations could not be made, while alcohol even in high concentration seemed to have little effect other than an increase of the pulse-volume.

Cumulative Action of Digitalis.—If cats receive a toxic dose of digitoxin, it requires some time before slowing of the pulse will appear; this slowing may, however, persist for seven days before the animal dies. Sometimes the pulse becomes extremely frequent and irregular before death; at other times, extreme bradycardia persists. The intensity of the symptoms does not depend alone upon the amount of drug circulating in the blood in a given time, but also upon the way it is given: thus a single dose may kill, while the same amount given in two doses during twenty-four hours need cause no toxic symptoms. Many small, inactive doses will cause summation of effect, so that a slowing is noticed after several days; this slowing will persist for days like after a single large dose, but toxic symptoms are generally avoided. Digitalin acts more rapidly but the bradycardia persists equally as long as with digitoxin, according to A. FRAENKEL (Arch. f. exp. Path. u. Pharmak., Vol. 51, No. 1). It is much easier, however, to determine a continuous dose without inducing toxic symptoms, but even after ninety days a slight increase in the dose will be followed by vomiting, since tolerance is not established. Strophanthin acts still more rapidly, but the same cumulative action develops. In this respect all three substances seem to be alike. For each one there is a daily dose which does not become toxic even after weeks. The fatal dose of digitoxin is about 0.08 milligram per kilogram; this corresponds to 0.48 milligram of digitalin. With the former glucoside, one-third of the fatal dose will cause intoxication after the third injection; with the latter, as much as one-half may be given for weeks with impunity. The degree of cumulative action probably does not depend on the rate of excretion, since strophanthin, being readily soluble, would be voided quickly; it is most likely due to some compound formed within the heart muscle which is only broken up with difficulty. The time which elapses before the symptoms appear, seems to depend solely on the solubility. It may be said in a general way that digitoxin is indicated where a short energetic cure is desired; digitalin and strophanthin are safer for long-continued daily use and the latter especially where rapid action is desired.

Pure Carbolic Acid in the Treatment of Smallpox.—This disease is relatively prevalent in the eastern Canadian provinces. JAMES T. NEECH and F. J. HODGSON (Lancet, Dec. 26, 1903) report their experiences by this method of treatment in 136 cases. Of this number five died, which gives a death rate of 3.6 per cent. The epidemic was a mild one. The bulk of the patients were not efficiently vaccinated, so that the character of the disease and the modifying effects of vaccination did not materially contribute to this low rate. The method adopted was to apply the pure carbolic with a small camel's hair brush to the vesicles over a certain area each day until all had been touched. These applications were continued until the vesicles showed signs of drying up. Toxic carboluria was present in but two cases, both belonging to one family, so that idiosyncrasy might have been present. In a number of cases only one side of the patient was treated with carbolic acid, the other receiving applications of camphor or guaiacol or formalin. In every case it was plain to see that the carbolic acid was the best. The pain of the applications is very slight, but to compensate for this, the itching was immediately and in most cases permanently relieved. The postules rapidly shriveled and the further development of papules and vesicules was either prevented, or, if not aborted completely, very nearly so. All vesicles were scabbed under this treatment in from five to ten days and in from ten to eighteen days the scabs had fallen off, except those in the palms of the hand and soles of the feet. The tendency to the formation of scars was very much reduced by the treatment. The offensive odor characteristic of the disease was entirely absent. The absorption of septic material from the postules was almost entirely stopped. This kept the temperature at a relatively low level after the appearance of the pustular stage, it never rising above 102° F., even in confluent attacks in the unvaccinated. Delirium was infrequent and no rise of pulse marked the advent of the pustular stage. The danger of infection by aerial convection is so much lessened that patients can with safety be discharged ten days before the usual time. Under this treatment, in these 136 cases, there was an entire absence of complications.

Arsenic Habit.—Some interesting experiments are recorded by W. HAUSMANN (Deut. med. Woch., Dec. 31, 1903), who was able to immunize fowls and dogs against arsenic by treating them with repeated small doses. The degree of immunity was very slight and resembled that which is seen among the inhabitants of Steiermark in Europe who are renowed as habitual arsenic eaters. These people and also the experimental animals are known to succumb when larger doses are given and the amount tolerated is even less than that ingested by normal individuals who had never been accustomed to the drug. It was found that the arsenic was less toxic in the powder form than in solution.

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ARE EXCITATION, INHIBITION AND NARCOSIS DIFFERENT PHASES OF THE SAME ACTIVITY?

THERE are no three processes in the physiology of the nervous system that to so great a degree challenge the speculative powers of physiologist and neurologist alike, as excitation, inhibition and narcosis.

The latest theory of the nature of these mysterious phenomena is advanced by one who has worked and pondered over them for many years, by N. E. Wedensky (*Pflüger's Archiv*, Nov. 19, 1903), who holds them all manifestations of one common activity.

Hitherto physiologists have attributed excitatory and inhibitory manifestations to distinct centers and nerves, whose functions are diametrically opposed to each other, the former giving rise to oxidative or catabolic, and the latter causing synthetic or anabolic processes in the tissues affected. The fact that stimulation of cortical motor areas, as discovered by the author and confirmed by Hering and Sherrington, produces not only contraction of certain muscles but also relaxation of the antagonists of the latter, can have only one explanation, namely, that inhibitory phenomena in the nervous system are universal and are evoked simultaneously with every excitatory process. The author questions whether it is necessary to assume the existence of special inhibitory mechanisms, and suggests that the apparatus which usually stimulates, may at times exert instead the opposite effect; that along one and the same path and to one and the same endorgan, under certain conditions, either excitatory or inhibitory impulses may pass.

The inhibitory action of the vagus was at first attributed to an exhaustion of the nerve produced by strong shocks, yet it has been shown in the case of muscle-nerve preparations that as soon as the inhibitory influence has gone, it is possible to get the muscle to react to weak excitatory stimuli. Closely allied to this is the subject of narcosis, which has been attributed to the power of the nerve-cell to draw in its dendrites, which power would cause the phenomena of sleep and narcosis by breaking the intimacy of contact between contiguous nerve-cells. There is no connection between nerve excitability and nerve conductivity. The former may be suppressed while the latter will survive. Thus chloroform, ether, carbon dioxide and alcohol would narcotize the nerve, reducing its excitability, and yet not affect in the least its conductivity to nerve-impulses. Wedensky found that in the early stage of the narcosis of a part of a nerve there is really a reduction in the conductivity for all degrees of impulses excited in the normal part of the nerve (provisional stage), but in the later stage of narcosis the more powerful impulses are not transmitted by the narcotized nerve, while weak impulses are freely transmitted (paradoxical stage). The narcotized stretch of nerve preserves its power of conducting weak impulses longer than any other portion.

The explanation of these phenomena is that there is no distinction, as processes, between conductivity and excitation. In the paradoxical stage the impulse starting in the normal portion of the nerve produces in the narcotized portion an inhibitory effect. This has been proved by the experiment of stimulating the narcotized portion in such a way as to produce a weak contraction and before this has disappeared, to send into the nerve above the narcotized portion another shock, with the result that the contraction suddenly ceases: as soon as the latter shock is discontinued, the contraction is resumed. This experiment is of engrossing interest for three reasons: First, it shows the inhibitory influence of one portion of the nerve upon another. Second, while formerly the narcotized por-

tion was considered as offering a resistance to the oncoming impulse, the above experiment teaches that the oncoming impulse, by acting on the narcotized portion which it is obliged to traverse, causes the blocking of its own passage. Thirdly, there is a reciprocal effect, that of the narcotized portion on the oncoming impulse and that of the impulse on the narcotized portion. The experiment leads logically to the conclusion that excitation, inhibition and narcosis border upon and merge into one another. In the later phases of the narcosis of a part of a nerve, tetanic stimuli applied to the normal portion produce a relatively long after-effect of inhibition, leaving the nerve in a condition of deeper narcosis.

What, then, is narcosis? If this is in direct relationship with inhibition or, as seen above, merges into it, while the latter is firmly bound up with the process of excitation and in certain cases is a modification of it, corresponding to strong excitatory impulses, while weak ones produce the customary stimulating effects, then narcosis would be nothing more than a mere modification of excitation. By using ordinary chemical stimuli, the author could produce conditions in the nerve similar to narcosis. The same could be brought about by high temperatures, but not high enough to kill the nerve. The reduction in conductivity brought about by passing a constant current through the nerve, produces in its early stages the same paradoxical condition noted in the early stages of narcosis. In fact, many forms of stimulation, chemical, mechanical, electrical and thermal, of a certain strength and duration, evoke in the nerve the same condition as narcotics. This condition the author terms "parabiosis," which has a more generalized significance than the word "narcosis," inasmuch as it represents the general reaction of the nerve to heterogeneous influences and is also the condition through which all nerves pass antecedent to death. It also represents a condition which is much more general than that of excitation or activity in the restricted sense. The nerve is capable of passing through four conditions, which merge imperceptibly into one another, and which, in order, are: A, Rest, B, Activity, C, Parabiosis (Narcosis, Inhibition), D, Death. B and C represent the condition of excitation. B is that form and stage of excitation which reveal themselves by means of outward effects. C is a condition of stable excitation remaining localized at its place of initiation. The transition from A to B may be regarded as increased irritability. But if the agent employed has not the property of producing an excitation in the ordinary sense, the increased irritability may pass directly into C, as occurs with chemical stimuli in weak solution and the majority of poisons. In individual instances the direct transition from A to C is possible without the intermediate phase of increased irritability (the action of ammonia). The transition from B to C is shown by all those stages termed by the author "transitional," namely, the provisional, paradoxical and inhibitory stages. Finally, under certain conditions C passes into D, inhibition in narcosis merges into death. It is well known that stimulants and narcotics in greater intensity and on prolonged action usher in final dissolution. Wedensky believes that every agent, before it kills the nerve, causes it to pass through the condition of parabiosis, just as the dying muscle first passes through the condition of rigor mortis.

OPERATIONS FOR NEPHRITIS.

IN the symposium on nephritis at the recent meeting of the Medical Society of the State of New York, published in abstract in the MEDICAL NEWS, February 6, 1904, a number of very interesting considerations with regard to the possible extension of operative procedures to the cure of nephritis were brought up.

There seems no reason to doubt now that surgery can do something for kidney disease, though it cannot accomplish as much as has been fondly hoped at times in quite recent years. Mr. Reginald Harrison's operation for the relief of hyperemic congestion of the kidneys has proved to be of service in other hands besides his own. As the result of his observations when nephritis occurs in the course of an infectious disease and symptoms of renal inadequacy begin to assert themselves, it would seem advisable for the medical man to be ready to call a surgeon in consultation. If in a case where there have been casts and albumin for some days the urine begins to grow markedly less and finally is passed in small quantities, or even absolute anuria occurs for twelve to twenty-four hours, then a hope for the patient may be found in the splitting of the fibrous capsule of the kidney.

Mr. Reginald Harrison has very picturesquely called this condition, "glaucoma of the kidney." When the kidney is laid bare the fibrous capsule is found very tense and as soon as an opening is made in it, along the white line of the external edge the parenchyma of the kidney comes bulging

out of the capsule. Within a few hours after the operation as a rule, the kidneys begin to secrete again and usually a lessening of the toxemia seems to occur.

With regard to the so-called Edebohls operation, and the removal of the fibrous capsule of the kidney with the idea of providing a new circulation for the cortex of the kidney some very interesting additions to our knowledge were made. Dr. Willis G. Macdonald, of Albany, called attention to the fact that every surgeon who has operated much on floating kidney has found not infrequently that the fixation of a movable kidney in the loin was followed by a very notable improvement in urinary symptoms. Whenever a kidney is very movable there is almost sure to be some albumin and casts in the urine. The albumin is usually not much in amount. The specific gravity of the urine is about normal. The casts are not of the dangerous degenerative varieties, they do not contain broken down cellular material nor blood cells, but are simple hyaline cylinders. After the operation these urinary symptoms practically disappear and the patient may live for many years without any further symptoms of nephritis. The condition seems to be almost the same as that of the kidney of pregnancy, which, during actual child-bearing, may give all the symptoms of a real nephritis and yet clear up completely after labor, leaving no trace of the supposed serious condition that existed.

From this, however, to the cure of real nephritis, by stripping the kidney capsule in order to secure a new blood supply by the adhesions which form is a long step. As Dr. Van Cott, of Brooklyn, said, the hope in such a case must be that somehow the blood supply will be obtained from the fatty capsule of the kidney. Unfortunately for the theory, however, the blood vessels of the fatty capsule are not numerous and the course of the blood in them is away from the kidney. When fibrous capsule is removed in animals a new connective tissue covering for that organ develops much thicker than before and commonly sends down strands of connective tissue into the secreting substance of the cortex. Like all connective tissues, this has eventually a tendency to contract, and during the course of contraction it seriously interferes with the parenchymatous structures in its neighborhood. There seems to be very little hope on general principles of securing a new blood supply for the kidney by the mere removal of the fibrous capsule, even though it should not regenerate.

Supposing, however, that an additional blood supply should develop for the secreting portion of the kidney, it is doubtful whether this would be of any particular benefit.

Not long since a distinguished comparative anatomist was present at an operation done on a young doctor for nephritis with stripping of the capsule as the central idea for possible relief of symptoms. He had never seen the operation done before and he asked how soon they expected the new blood vessels to form. They said in a few days, though of course they expected them to continue to grow for several weeks or even more. His reply was that if they expected them to grow in ten years, he might think something of their theory.

It is a difficult matter, however, to compare theory with experience. There are certainly some cases reported, as for instance, three at the meeting of the American Physicians in Washington, last spring, in which relief was afforded by the performance of the Edebohls operation. While it may not be beneficial for many cases, there seem to be some in which it does good.

In the meantime medical men must remember that mild cases of nephritis or even those that are severe, but have already lasted for many years, should not be subjected to the strain of an operative procedure with the associated irritation of the administration of ether, until the status of the operation has been more definitely determined by its application to more hopeless cases. Every physician of any experience in kidney disease has patients under observation who have suffered from nephritis for ten or even fifteen years and yet are fairly well, only that they lack endurance. Such patients are much more likely to be harmed than helped by any operative procedure, for it is possible that they may live out a normally long life, even with damaged though not inadequate kidneys.

ECHOES AND NEWS.

NEW YORK.

Columbia and the College of Pharmacy.—Negotiations are on foot to make the College of Pharmacy a part of Columbia University, subject to the approval of the members of the college at the annual meeting on March 15. Nicholas Murray Butler, President of Columbia, has been nominated President of the college by the Trustees of that institution. Dean Charles F. Chandler, now President of the college, will become the First Vice President. Several years ago proposals by the College of Pharmacy to unite with Columbia had no result. Recently, however, it had been resolved by Columbia

that some provision must be made in its educational system for pharmacy. Michigan, Wisconsin, Northwestern and Minnesota have heretofore been the largest universities recognizing pharmacy. It is proposed that the college will hold the same relation to Columbia that Barnard and the Teachers' now do. Next month's annual meeting is the seventy-fifth anniversary of the founding of the college, in 1829. The rest of the ticket nominated includes: Second Vice President, William Jay Schieffelin; Third Vice President, Herbert D. Robbins; Trustees to 1907, John R. Caswell, Otto P. Amend, Oscar Goldman, Adolph Henning, and Charles H. White.

Examination for Superintendent of New State Hospital.—Five candidates for appointment to the post of superintendent of the new State Hospital for the Treatment of Consumptives were subjected on Feb. 13 to an actual test of their ability to deal with tuberculosis. The candidates, who are all physicians of at least six years' experience in general practice, and of one year's service in a hospital, were taken to the Albany Hospital by the Board of Examiners, where each was required to examine and discover the physical condition of five patients. The institution, which will be ready for occupancy within a short period, is located at Raybrook, in the Adirondacks.

Flower Hospital's Physical Therapy Clinic.—This hospital has recently put in a thorough equipment of electro-therapeutic and mechano-therapeutic appliances.

Bacteria and Money.—New York money may not be so dangerously dirty after all. Dr. Thomas Darlington, President of the Health Department, last week received a verbal report from Dr. Park, the bacteriologist who is developing germ cultures from old bills and copper coins, and the President was relieved to hear that if there were any malignant germs in the money they were not to be discovered under the microscope. Neither Dr. Darlington nor Dr. Park were satisfied, however, the money does not figure in the transmission of disease, and in consequence the investigation is to be carried on to a finish. Washes have been made from the cultures and they will be injected into rabbits and guinea-pigs. Indeed, that course of investigation has already been begun, and there are several of the little animals with the extract of money in their veins under observation. "It will take several weeks," said Dr. Darlington, "before the disease germs, if they exist, take effect upon the animals which are being used in the experiment. For that reason it cannot positively be said that money is not a medium for the propagation of contagious diseases. Dr. Park is carrying on a most important experiment with copper coins. It is a question, in my mind, whether copper does not exercise a fatal effect on germs of all kinds. Dr. Park has placed germ cultures on a number of these small coppers and is watching them to see if they survive."

Report of Adirondack Cottage Sanitarium.—We are pleased to acknowledge the receipt of the Nineteenth Annual Report of this institution, which is a modest little booklet given over largely to statements of cases treated, with their results, and to acknowledgment of moneys received from friends of the institution. There is no evidence of vain boasting or theatrical display, nor does the pamphlet abound in high-sounding phrases telling how great a work is being done by this pioneer among consumptive sanitaria. All that is left to the reader to be gathered from actual results. In grateful recognition of the kindnesses of its supporters, the report says:

"Again, as in the past, the deficit in the yearly running expenses has been met entirely by voluntary contributions of the Sanitarium's friends, and it is a source of congratulation that the expense to the patient, $5 a week, has been kept the same for twenty years, in spite of the greatly increased cost of operating the institution due to the growth and expansion of the work in many directions, the perfection and development of methods, the many additional advantages the patients now enjoy, and the higher cost of fuel, provisions, and supplies."

During the past year 298 patients have been treated, which is the largest number since the establishment of the Sanitarium. To find out as nearly as possible the benefit derived by its patients from the course of treatment outlined and also as a matter of scientific statistical interest, Dr. Lawrason Brown, the Resident Physician, has made a very exhaustive inquiry into the records of previous cases. "Of 1,500 cases which have been discharged from two to seventeen years ago, 334 could not be traced, leaving 1,066 which have been traced. Of these, 46.7 per cent. are still living. Thirty-one per cent. are known to be well at present; in 6.5 per cent. the disease is still arrested; 4 per cent. have relapsed; 5.2 per cent. are chronic invalids, and 53.3 per cent. are dead. Thus we learn that 31 per cent. of all cases discharged from two to seventeen years ago have remained well." This is certainly very encouraging when we consider how terribly fatal the disease is considered to be, not only by the laity but by the profession as well; and it is likely if the present rate of progress continues that experience derived from the treatment of an increasing number of patients for another seventeen years will be the means of doubling this percentage.

Especially commendable is the fact that the institution is primarily for those in very moderate circumstances. The rich can always be benefited for a time at least by careful nursing, change of climate, and all the safeguards that go with wealth and luxury; but here we have a place where wealth is actually a bar to entrance, and the primary object still is, as it was conceived in the mind of its founder at the beginning, to provide for the care of the nominally poor.

Summing up the year's work the following facts are noted:

"The work done by the Sanitarium during the past year may be summed up briefly as follows: Two hundred and ninety-eight patients have been treated. To two hundred and fifty-seven of these the institution has furnished the best possible means of restoration to health at a nominal cost, and to forty-one entirely free of cost to them." The names of many of America's most widely known philanthropists occur in the record of beneficers, and not the least among these is that of the indefatigable physician to whom the whole world owes a debt of gratitude in his zeal for the stamping out of tuberculosis on this side of the Atlantic.

Bad State Charity Laws.—The annual report of the State Charities Aid Association to the State Board of Charities was made public last week. It contains, among other things, a review of the bills that came before the legislature last year affecting the State's charitable institutions. It says that the legislative session of 1903, "while less momentous to the wards of the State than that of 1902, was characterized by a considerable number of important

measures affecting the welfare of the poor in their homes and public dependents in institutions." One of the most disastrous measures passed by the legislature and signed by Gov. Odell, the report says, was that which forbids the establishment of any hospital or camp for the treatment of patients suffering from pulmonary tuberculosis in any town without the consent of the town's governing board and of the Board of Supervisors of the county in which the town is. "The effect of this law," says the report, "is to make it impossible for any city in the State, or any fraternal order, charitable society or philanthropic individual to establish a hospital, camp or other establishment for the treatment of consumptives outside the city limits, except under conditions which are practically prohibitive." The report says that in the opinion of the association the country districts were sufficiently protected by the laws then existing, which forbade the establishment of any institutions for consumptives in the State without the approval of the State Board of Health and which laid down other restrictions. The report asserts also that the disease, instead of increasing, decreases in the districts in which institutions for its treatment are located. The report adds:

"By the passage of this law the thousands of sufferers from pulmonary tuberculosis in this State may be prevented from receiving the care and treatment which would result in their cure or improvement. More than 60 per cent. of the people of this State live in cities of 40,000 inhabitants, and it is among the poor in cities that the disease is most prevalent. It is deplorable that the interests of these unfortunate people should be subordinated to local property interests which were already amply protected by previously existing laws." Speaking of Bellevue Hospital the report says: "Steadily and by no means slowly the morale of Bellevue Hospital has followed in betterment the refreshing change in the appearance of its wards and halls, with constant effort to lay the foundations for a change in the attitude of the public toward the 'Bellevue' of the sensational press—if anything but the upbuilding of the hospital can accomplish this. The board of trustees has made gratifying progress also in its endeavor to secure a new and adequate plant for this hospital."

The report emphasizes the urgent need for new State institutions for the feeble-minded, the idiotic and the epileptic, recommends that the State Board of Charities should have the power to transfer inmates from one State charitable institution to another, and to determine the capacity of each institution, and indorses all efforts that are being put forth to improve the industrial features of the State's charitable institutions.

PHILADELPHIA.

New Medico-Chirurgical Hospital Opened.—The new Medico-Chirurgical Hospital, rebuilt after the explosion of a water heater one year ago which virtually ruined the old building, is now ready for the reception of patients. It is the best that modern hospital construction and equipment can furnish. General wards, private wards, and private rooms are included in the building.

Medical Inspectors Appointed.—The forty additional assistant medical inspectors have been appointed by the Bureau of Health and been sworn into office. The districts are determined by ward lines. In several instances where the wards are small one inspector has charge of two wards; in case of the larger wards, two or even three inspectors are assigned to a ward. The inspectors will look after cases of contagious diseases, inspect schools, and do the city's vaccine work. Instruction in the shape of short lectures will be given the members of the corps until they are thoroughly conversant with their duties.

Society for Prevention of the Spread of Tuberculosis.—At a recent meeting of this society an active campaign for the prevention of the spread of tuberculosis and other contagious diseases was outlined. Among the measures proposed were the cleaning of streets only between midnight and six o'clock in the morning with thorough wetting of the streets before cleaning, withdrawal of all trolley cars with upholstered seats, heating of cars in cold weather, and the enforcement of the anti-spitting ordinances. It was decided to make an exhibit at St. Louis of charts, maps, and statistics relative to the prevalence of tuberculosis in Philadelphia.

Smallpox Statistics.—The returns of smallpox cases throughout Pennsylvania for January show a considerable decrease as compared with those of December or November. In Philadelphia there has been no lessening in the disease, and the death rate for January was nearly three times that for November. During the three months mentioned there were in the State 2,456 cases of smallpox with 297 deaths. About two-fifths of the cases and two-thirds of the deaths occurred in Philadelphia.

The Administrative Control of Tuberculosis.—Dr. Hermann M. Biggs, of New York, in an address on the above subject before the Phipps Institute February 15, gave a résumé of the work accomplished along this line by the New York Health Department. He showed in a most convincing array of statistics that the spread of the disease had been checked by the methods employed in that city and also stated that any municipality could accomplish similar results if active measures were employed. That no new discoveries are being taken advantage of in New York was made emphatic by Dr. Biggs, who said at the outset that it was remarkable that so little had been done in controlling tuberculosis when we consider that practically all we now know regarding the sanitary measures necessary were known fifteen or twenty years ago. Results come from putting into practice the things that are commonly known. Mayor Weaver, who presided at the meeting, said that Philadelphia was ready to put in practice the methods shown to be so successful in New York whenever the people, or even the medical profession, of the city were ready for their adoption.—See MEDICAL NEWS, Special Article, this week.

Changes in the Intercostal Muscles in Pneumonia and Pleurisy.—At the meeting of the Pathological Society of Philadelphia, January 28, Dr. W. M. L. Coplin read a paper on this subject, stating that no important studies of the relations, if any, existing between the intercostal muscles and inflammations of the lung and pleura had been carried out. In this preliminary note he gave the findings in seven cases that have been studied. Of these, two were croupous pneumonia, two tuberculous pleurisies, two acute pneumococcus pleurisies, and one chronic empyema. The changes observed in the muscles were as follows, though their order of occurrence may not be the same as given: (1) Granular degeneration or cloudy swelling of the muscle fibers. This is probably a part of the systemic action of toxic bodies circulating in the blood; (2) the muscle fibers are dissociated, edema is present, but there is but little

fibrin containing substance. Groups of muscle fibers and bundles show changes that cannot be differentiated from the hyaline degeneration described by Zenker as occurring in the muscles of the abdominal wall in cases of typhoid fever; (3) the preceding change is increased and fibrin and leucocytes (mainly mononuclear) become abundant. Bacteria are often conspicuous. From the specimens studied it is inferred that the necrotic material thus formed is removed and sclerosis results. In the chronic empyema newly formed and forming fibrous tissue is present and there is conspicuous fatty infiltration of the muscle. This seems to be due to the long-continued infection of the pleura. The pathogenesis of the condition described is not entirely clear but is probably explained by the lymph tracts of the muscle carrying off toxic material from the pleura. The alteration in physical sounds over the affected area, the occurrence of intercostal neuralgias during the course of pneumonia, etc., suggest themselves from the study of the muscle changes thus briefly outlined.

Honors to Dr. Wiggin.—Dr. Frederick Holme Wiggin, of New York, at the invitation of the Montgomery Gynecological Society of the Jefferson Medical College, delivered an address on "Some Practical Points in Abdominal Surgery with Special Reference to a Simple Technic for Appendicectomy and Intestinal Anastomosis," before the student body of that Institution, in the lecture room of the college, on the occasion of the Annual Meeting of the Society, which was held on the evening of Feb. 2. Later in the evening Dr. Wiggin was entertained at a dinner given by the Society at the Colonnade Hotel in his honor.

CHICAGO.

Addition to Presbyterian Hospital.—The Directors of this institution are considering plans for the construction of additions to the hospital, which will include a surgical pavilion and a new out-patient dispensary for the poor. Part of the $500,000 necessary for these additions has already been pledged.

Work of the Chicago Pasteur Institute.—The Director of this institute in Chicago reports that since the institute was opened, July 2, 1890, 2,026 patients have received the anti-hydrophobic treatment. Of these, 1,807 had been bitten by dogs, 76 by horses, 57 by cats, 19 by cows, 18 by skunks, 25 by other animals, and 22 were infected by hydrophobic human beings. Of individuals bitten by animals absolutely known to have been rabid, 982 were treated; of patients bitten by animals presumed to have been rabid because of symptoms of disease during life, 776 were treated, while 268 cases were cared for in which rabies was suspected. Only 7 deaths were reported, a mortality of 0.34 per cent. Six individuals abandoned treatment, two of whom subsequently died from hydrophobia.

Examination of the Urine and Segregated Urines as a Means of Diagnosis in Surgical Diseases of the Kidney.—Dr. M. L. Harris read a paper on this subject before a recent meeting of the Chicago Medical Society, and among other things he said that as most of the so-called surgical affections of the kidneys are due to microorganisms, it is important to know the kind of infection present. This means in most cases a bacteriological examination by the usual culture and tinctorial methods. The essential point in this connection is the obtaining of the urine uncontaminated with organisms from external sources. In the female the urine should invariably be obtained by the use of a sterile catheter introduced after proper cleansing of the parts. In the male the same procedure may be used, or if there has been no disease of the lower urinary tract, it is sufficient to urinate, after thoroughly cleansing the urethral opening and discarding the first portion that escaped into a sterile receptacle, from which inoculations should be made immediately. If there has been an infection of the urethra, this canal should be cleansed as thoroughly as possible by irrigation before attempting to collect the urine. The microorganisms most frequently found are the *Bacillus coli communis*, *Bacillus tuberculosis*, and various staphylococci and streptococci, the *Bacillus proteus*, and rarely the *Bacillus typhosus* and *Diplococcus pneumoniæ*. The effect of the presence of these bacteria on the reaction of the urine varies, so that the reaction of the urine becomes a point of some diagnostic significance. To be of value, however, the reaction must be taken at once, as an acid urine may become more acid or change to alkaline within a short time after it is passed, owing to external contamination. The normal acid reaction of the urine is not changed by the colon bacillus, the tubercle bacillus, or the streptococcus, while the staphylococci and the *Bacillus proteus* render the urine alkaline, owing to the decomposition of urea with the formation of ammonium carbonate. In the presence of an alkaline urine it should be determined whether the alkalinity be due to the so-called earthy bases, to alkalies introduced medicinally, or to ammonia. If due to ammonia, it indicates an infection with some urea decomposing organisms. The tubercle bacillus does not grow on the usual culture media, but is recognized by its peculiar tinctorial properties. In practically all cases of tuberculosis of the kidneys this bacillus may be detected in the urine, if a sufficient number of carefully conducted examinations be made. The possibility of confounding it with the smegma bacillus should be borne in mind and the proper precautions taken. The use of the microscope is absolutely necessary in order to detect the presence of pus or blood in the urine in anything but the most apparent macroscopic quantities. This statement would not have been deemed necessary, did not one still occasionally hear a physician speak of the cloudiness or deposit due to precipitated urates as pus, or the high-colored cloudy urine of concentration as due to blood, simply on their appearance. The presence of pus in the urine is always an indication of an infection of some portion of the urinary tract, unless it has ruptured into it accidentally in some neighboring organ. While the kind of infection should always be determined when possible by the culture methods, as already mentioned, still the following points are of practical clinical importance:

A pus-containing urine, alkaline owing to the presence of ammonia, is probably due to the presence of the staphylococcus or proteus. A culture obtained from an acid, pus-containing urine is most commonly the colon bacillus. An acid or neutral pus-containing urine which remains sterile on ordinary culture media is almost always due to tuberculosis, even though no tubercle bacilli are found on examination. Mixed infections, of course, may exist. Blood in the urine, when it comes from the kidneys, is usually due to malignant tumor, tuberculosis, or renal calculus. The essayist then considered the blood in cases of malignant tumor, tuberculosis, renal calculus, etc. The most careful ex-

amination of the urine often furnishes sufficient data upon which to base a correct diagnosis as to the location of the lesion. The history will frequently make up the deficiency, but only too often this is also wanting, when recourse must be had to other means. These are mainly cystoscopy, or inspection of the interior of the bladder, and the collection of the urine directly from each kidney separately. The use of the cystoscope is absolutely essential to a correct diagnosis in many diseases of the urinary tract. Collecting the urine directly from each kidney separately is the greatest advancement which has been made in the diagnosis of surgical renal affections in modern times. There are two practical methods of accomplishing this, namely, the use of the urine segregator and catheterization of the ureters. Each of these methods has its advantages and its limitations. After quite an extensive experience with the segregator, he stated that its intelligent use in suitable cases furnishes results which are reliable and gratifying. It does not take the place of the cystoscope, but should be used in connection with that instrument. It does not supplant entirely catheterization of the ureters, as there are cases in which the latter is the more suitable, but that it does have a very useful field is certain. The advantage of collecting the urines directly from the kidneys is very great. We are thereby not only able to exclude entirely the lower urinary tract, but to determine whether the disease affecting the kidneys is bilateral or unilateral, and if the latter, which side is involved. No diagnosis of these affections is now complete without these facts. An examination of the urine in the surgical diseases of the kidneys must take into consideration not only the pathological constituents but also the comparative amounts of normal constituents eliminated by each kidney, in order that the proper treatment may be carried out and a correct prognosis given.

Efforts to Prevent and Suppress Typhoid Fever.—Rules and regulations have been prepared by the Illinois State Board of Health with reference to the prevention and suppression of typhoid fever. They were formally adopted by the board at its annual meeting, copies of which have been sent to all the newspapers in the State, and to every county, township, village and city health officer, and they will also be distributed among the people by the local health officers.

Antitoxin and Diphtheria.—Proof that antitoxin saves hundreds of lives in Chicago each year is offered by the Health Department in its weekly bulletin. The use of antitoxin in the treatment of diphtheria was begun by the city nine years ago, and since that time the mortality has been 6,088, while during the nine years before 11,488 persons died. The decrease has been 5,400, or 47 per cent., while the population has increased nearly 600,000, or 52 per cent. Considering population, the decrease in deaths is given as 63 per cent.

GENERAL.

New Sewerage for Baltimore.—The city of Baltimore is constructing a sewer system which will cost $10,000,000. The discharge of all sewage into Chesapeake Bay is to be actively prohibited.

An Arctic Health Resort.—A curious health resort is about to be established in Lapland, way beyond the Polar Circle, according to one of our Swedish exchanges. The intention of the Government is to erect a sanitarium on the shores of Lake Torne, a long and beautiful sheet of water at Wassijauve, the end of the Ofote Railroad. The latter, by the way, is in itself a curious institution in that in a distance of 121 miles it boasts of only one solitary station. This is not anywhere near any human habitation, but right on the line between Sweden and Norway, and it was erected only for the requirements of the Customs Office. The sanitarium would be an ideal one for people with weak nerves who need absolute rest. Aside from the small settlement at Wassijauve the country is absolutely void of any signs of human existence, except for a few Laplanders who, with their herds of reindeer, pass through once in a while. Guests at the Arctic sanitarium will have for their only object of interest, aside from the scenery, a scientific station which has been erected by the Government out of funds subscribed privately by scientists and laymen interested in the object of the station. The observations and investigations to be conducted here will be various. In Summer biological, geological, botanical, entomological, and other researches will be made, while at all seasons meteorological, magnetic, and other observations are to be made. The station is a solidly built block-house containing seven rooms, and it is proposed to build the sanitarium in the same way.

Christian Science and the Law.—"No clear case of 'Christian Science' killing has reached the public attention in the East of late—a fact which may prove almost anything except that there haven't been any killings," says the *Times*. "Elsewhere, however, the 'healers' have been less successful in getting their victims quietly under ground, and there is peculiar interest in a case cautiously but comprehensibly reported by the papers in Portland, Ore. It seems that there the daughter, a child three years old, of one James MacKenzie accidentally poisoned herself with wintergreen oil that had been carelessly left within her reach after use for some domestic purpose. The father had been cured of a 'stomach trouble' by an Eddyite neighbor two years before, and therefore, when the baby grew pale and still he sent for the convenient wizard. The usual mummeries were performed and the usual cure announced. Later in the night it became obvious even to a 'Christian Science' father that the child was dying, and he sent for a doctor. At the subsequent inquest the doctor testified that it was probably too late to save the baby's life, even when the wizard was called in. That contented the Coroner's jury, and it brought in a short, safe verdict of accidental death by poison self-administered. Thereupon there was great joy in the ranks of the deniers, and their local spokesman gravely proclaimed that from the testimony given at the inquest it was evident that 'Christian Science' had done more for the poisoned child than materia medica, whatever that may mean, was able to accomplish! Well, the little girl did live for some time after the incantations were chanted over her, and did die soon after a regular physician took the case. The argument is certainly a strong one—for imbeciles. It is a little queer, though, that the wizard failed, since he declared at the inquest that 'Christian Science' is easily effectual in all poisoning cases, and that he had saved one of his own children from the effects of a big dose of carbolic acid. It is really a wonder that the jury didn't hold the doctor to trial for manslaughter, if not for outright murder."

OBITUARY.

Dr. JOHN MERCER ADLER died of apoplexy in Devon, near Philadelphia, on February 11. He was seventy-six years old, and was one of the most prominent medical, literary, and art representatives in the city. Dr. Adler was born in Georgetown, D. C., and was edu-

cated in Georgetown College and Princeton University. Studying medicine at Columbia University, he was graduated with the class of 1847. Immediately after this he went to Colon, being connected with the Panama Railroad. Three years later he returned to this country, going to Davenport, Ia., as chief physician of the Military Hospital there, and was in charge during the entire Civil War. With the close of the war he came to Philadelphia. He was prominently connected with a number of leading medical societies, was the author of medical works, and was also actively engaged in life insurance organizations.

Dr. MAX G. RAFAEL, who served as a surgeon in the Union navy during the Civil War and who was formerly a Deputy Coroner, died suddenly last week of apoplexy. He was in his sixty-eighth year. Dr. Rafael was born at Salem, in the Province of Baden, Germany. He came to this country at an early age and studied medicine at the Humboldt College, St. Louis. When the Civil War broke out he was commissioned a surgeon in the navy and served under Admirals Farragut and Porter. At the close of the war he began to practice medicine in New York. He was a deputy under Coroner Brady.

Dr. EMIL ALEXANDER DE SCHWEINITZ, Chief of Division in the Department of Agriculture and a noted bacteriologist, in which science, although yet a comparatively young man, he had made many original investigations, died in Washington last Monday of uremia. In recent years he had been Dean of the Medical School of the Columbian University. He was born at Salem, N. C., Jan. 18, 1866, being the son of Bishop E. A. de Schweinitz. He studied at Nazareth Hall and Bethlehem, Pa., and was graduated from the University of North Carolina in 1882, afterward receiving the degree of Doctor of Philosophy at Göttingen, Germany, and of Doctor of Medicine from the Columbian University. He was United States delegate to the Fourth International Congress on Tuberculosis at Paris in 1898, and in Berlin the following year. He held the same appointment to the International Medical Congress and Congress for Hygiene at Paris in 1900, and published many papers on bacteria, disinfectants and hygienic problems, and on the various antitoxins, tuberculosis being perhaps his especial study. He was a member of the Metropolitan, Cosmos, and Chevy Clubs, and of various scientific, chemical, and bacteriological societies, both American and foreign.

Dr. AUGUST KREHBIEL, of New York, died last week. He was born in Bavaria, Germany, in 1839, and came to America in 1854. He returned to Germany and studied medicine in the University of Würzburg and was graduated. He again came to America and for twenty-five years was actively engaged in practice in this city, returning fifteen years ago.

Dr. FRANK S. BOK, a prominent physician and Odd Fellow, of Pulaski, and Coroner of Oswego county, N. Y., for ten years, died in Oswego last week from pneumonia, aged thirty-six years.

CORRESPONDENCE.

OUR LONDON LETTER.

(From Our Special Correspondent.)

LONDON, January 29.

PHYSICAL DETERIORATION OF THE BRITISH PEOPLE—THE LIGHT CURE IN LONDON—THE MENTAL AND MORAL EFFECTS OF THE SOUTH AFRICAN WAR—AN ANTI-CIGARETTE CRUSADE—NURSES FOR SICK DOGS.

AS HAS been mentioned in previous letters, the British people have recently awakened to the fact that the standard of national physique is seriously deteriorating. This is shown by the large proportion of stunted and weedy lads found among those who offer themselves for enlistment in the army, and the vast amount of disease and deformity among the rising generation in populous cities pent. It is tolerably certain that unless the *urbipetal* tendency of the men and women who in a physical sense form the backbone of our population can be checked, and unless wholesomer conditions of life can be provided for the denizens of our town slums, the British people will in a century or two, perhaps less, degenerate into a race of sickly dwarfs, with the marks of inherited disease and depraved habits writ large upon them. Even amid the din of the great fiscal fight the voices of some who are striving to find a means of preventing a national danger have reached the ears of the powers that be. A special committee is now sitting and taking evidence on the subject. But such committees are mere safety valves for the Government in ebullitions of popular feeling. By the time the Committee has brought its labors to a close, the excitement has probably died down, and the report is quietly relegated to one of the pigeonholes where so many schemes of reform repose, as in a limbo of stillborn souls. It appears to be intended that the committee shall play the part of John the Baptist by preparing the way for a Royal Commission. But Royal Commissions, too, are often mere Greek choruses, proclaiming moral sentiment and giving good advice to which no one pays attention. A more hopeful sign is that the medical profession has been aroused to action in the matter. A petition has been drawn up and has already been signed by more than 8,000 medical practitioners, including Sir William Broadbent, Sir Lauder Brunton, Sir Thomas Barlow, Sir Victor Horsley, Sir William Macewen, Sir Henry Thompson, Sir Samuel Wilks, and the Presidents of the Royal Colleges of Physicians and Surgeons, which it is intended to present to the Central Educational Authorities of the United Kingdom. These authorities are urged to consider "whether it would not be possible to include in the curricula of the elementary schools, and to encourage in secondary schools, such teaching as may, without developing any tendency to what is unwholesome, lead children to appreciate at their true value healthful bodily conditions as regards cleanliness, pure air, food, drink, etc." Attention is called to what is already being done in this way in English-speaking countries, especially in the United States. It is pointed out that much of the degeneracy, disease and accident with which medical men have to deal is directly or indirectly due to use of alcohol. Inasmuch as a widespread ignorance prevails concerning not only the nature and properties of that substance, but also its effects on the body and mind, the educational authorities are urged to include in the school teaching of hygiene elementary instruction at an early age on the nature and effects of alcohol. The intention of the petition is admirable, but a cynical critic might say that it leaves out of account the innate depravity of what Matthew Arnold called "the average sensual man." It is stated in the petition that about twenty-two million children are being educated under this system in the United States; it would be interesting to learn that the amount of drunkenness has been appreciably reduced in consequence. It may be said that we must wait till the next generation before we can estimate the practical effect of the teaching. But in this country it has not been found that the diffusion of education has greatly reduced either vice or crime. A fierce struggle has been made to retain religious instruction in the program of elementary schools, but this has had no perceptible influence on the growth of indifference in regard to re-

ligious belief and practice in the working classes which, according to the testimony of all observers, is a fact that Carlyle, if he were to rewrite his famous essay, would place among the "characteristics" of our time. A knowledge of the effects of alcohol on the body, even if it could be given in any real sense to young children, would probably have no more effect in practice than a knowledge of the evil effects of immoral acts of other kinds has on the conduct of the majority of young men. The true remedy, it seems to me, is to be found in the State interference which Herbert Spencer taught us to view with such suspicion, but which in a matter so nearly affecting the welfare and even the existence of the nation, is surely justifiable even from the standpoint of abstract philosophy. Already the State does much for the children of the poor; and if they are not merely poor, but criminal, it takes them in hand altogether and brings them up in institutions away from the corrupting influences of their home environment. In the formation of habits of self-restraint and the development of a sense of moral responsibility lies the hope of the production of useful citizens out of the raw material that now goes to the making of degenerates. Early education in State institutions, followed by compulsory service in the army or navy, would do more to check the deterioration of the British people than the teaching of hygienic maxims to children who see them defiantly disregarded in every act of life by those around them.

The prospectus of a Light Cure and Therapeutic Institute was recently issued. The purpose of the Institute was stated to be to provide London "with greater facilities for electrical treatment than are at present available at the hospitals." The capital was said to be $60,000, which, considering the heavy expense of installing Finsen, Roentgen and similar apparatus, strikes one as very inadequate for the purpose. It is not apparent whether the scheme is intended to be partly charitable, or a manifestation of philanthropy at 5 per cent. To-day comes an announcement of another enterprise of the same kind. A "Red Cross" Light Cure and Electrical Institute is said to have been established in a fashionable quarter of London. The promoters say "We shall expect patients to be sent to us just as they are sent to Bath or Wiesbaden by their own medical men who know the value of this wonderful cure." It may be gathered that these institutes are to be run by lay directors, who may or may not employ a medical practitioner to look after the patients. Often such establishments induce a member of the medical profession whose poverty, but not his will, consents to the degrading association; sometimes they hire a man whose name has been struck off the Register for professional misconduct. There is a "boom" in light here, for which the London Hospital is largely responsible. The Queen some years ago presented a Finsen lamp to that institution, a circumstance which the very wide-awake Governors took care to advertise early and often. They have gone on doing so ever since. I see in the *Westminster Gazette* of this day a statement that the London Hospital has now an installation of eight lamps with thirteen nurses told off to give their exclusive attention to the working of them. "Great results have been obtained, and patients have come from all parts of England to be cured." Similar statements are made in the newspapers from time to time, evidently with the intention of creating an impression in the public mind that the London Hospital is the true shrine of Light, where alone sufferers from lupus can hope for cure. The credulous public is assured that the treatment is *certain* and that it is *absolutely painless*—both statements, as all who know anything of the subject are well aware, being absolutely false. The "great results" referred to have to be taken on faith, as no authentic record of them has so far been given to the world. From what one hears, it would seem that the "greatness" of the results lies in the value got out of them as advertisements, rather than in the good done to the patients. Special departments for the light treatment have now been established in many hospitals, both in London and in the provinces. The results of the method as carried out in this country, however, are by no means so brilliant as those reported by Finsen and his colleagues at the Lys Institute at Copenhagen. The difference may partly be explained by the difficulty of getting English nurses to give themselves with sufficient devotion to work, which is not only tedious, but trying to the nervous system. This, however, is not the whole secret, for at the private institution under the direction of the well-known dermatologist, Mr. Malcolm Morris, who was the real pioneer of the method in England, the treatment is in the hands of a most capable Danish nurse, trained at Copenhagen; nevertheless, the results—which Morris and his assistant Dore have published with commendable frankness—though fairly satisfactory, will not bear comparison with those claimed by the Danish physicians.

To the January number of the *Journal of Mental Science*, just published, Dr. R. S. Stewart, of the Glamorgan County Asylum, contributes a paper on the mental and moral effects of the South African War on the British people. During the early months when news of defeats and what Lord Roberts afterward called "regrettable incidents" came thick and fast, the emotions felt by us were naturally extremely painful, but there was no note of despondency, and with the spirit of old Rome the nation was determined that the republic should suffer no detriment. At that time there was a notable decrease in the amount of crime of all kinds throughout the United Kingdom, showing an improvement of moral tone in the nation. A "disinclination to matrimony" was also noticeable in the dark days of Ladysmith, Maggersfontein, Colenso and Spion Kop. The national depression even affected the birth-rate; the annual reports of the Registrars-General for both England and Scotland for 1900 contain the statement that the birth-rate for that year was the lowest ever recorded. From a large mass of statistics which he has collected, Dr. Stewart concludes that while the war cloud lay heavy and black over the British people, the nation, as a whole, had its criminal propensities checked; there was a "lessened disposition toward all forms of self-indulgence, a heightening of the respect for the lives and property of others, and a lessened disposition to shirk the troubles and responsibilities of life." Gradually, however, the effect produced by our reverses passed away until by the end of the year it had vanished, and, morally speaking, our last state was worse than our first. I confess that Dr. Stewart's figures do not seem to me to prove much. But the most superficial observer could scarcely have failed to notice that the war—especially when the turn of the tide came—had a decidedly brutalizing tendency not only on the mob, but on many persons of education.

A manifesto bearing the signatures of many leading medical men—among them being Mr. John Tweedy, President of the Royal College of Surgeons of England—as well as bishops, Members of Parliament, and headmasters of schools, has recently been issued with the object of calling the attention of the public to the evils of cigarette-smoking by children. Reference is made to the great increase among the young in recent years of a habit "which is undoubtedly doing much to undermine the health and ruin the character of many English

boys in the various grades of society." The hope is expressed that every possible effort will be made to deal with what the signatories of the manifesto believe to be a very serious hindrance to the young life of the nation. Almost simultaneously with the issue of this document comes the announcement that there is to be a crusade against the cigarette in Birmingham where a conference on the subject is being held this day (January 29). The movement has the support of many leading members of the medical profession in Birmingham.

The professions open to women in this country are already overstocked, and "bachelor girls" are looking out for fresh fields and pastures new. Those who have a vocation for nursing and think the conditions of admission to that profession too arduous may find an outlet for their natural aptitude and energies as ministering angels in the tending of sick dogs. In the eyes of a considerable section of the British public the comfort of a dog is of considerably greater value than a human life; ladies who take up this interesting branch of nursing will, therefore, have the satisfaction of knowing that they have the privilege of doing what many people believe to be the noblest work that it is given to a mere human being to do. The Dogs' Protection League some time ago established what is virtually a hospital for dogs. A visit to the kennels, we are assured, is like walking through the ward of a hospital, for fair nurses are in constant attendance on the canine invalids, who lie in swaddling clothes, or if convalescent, are allowed to go about the "ward." An official of this philocynic institution described his patients as being "as bad as human beings." "Some of them," he said, "have to be nursed all night long, or they would tear away their clothes and do themselves any amount of harm." The League has, it is stated, received thousands of dogs since it began. It has always a staff of trained nurses in attendance, and the "hospital" is under the direct supervision of two well-known veterinary surgeons. A lady who wishes to adopt the profession of a dog nurse is taken on probation and receives a thorough training in the speciality. Then she goes out to whatever cases she may be called to. She is taught how to prescribe for a sick dog, physic it, diet it, and clothe it, in fact, how to adapt ordinary hospital nursing to the relief and care of sick dogs. Dog nursing is said to be extremely popular among ladies, and there is nothing at all improbable in the statement.

TYPHOID EPIDEMIOLOGY.

To the Editor of the MEDICAL NEWS:

DEAR SIR: In view of the frequency with which typhoid epidemics have of late appeared in various parts of the United States, and of the alarming proportions which some of them have assumed, it has seemed to me that it might be of interest to your readers to learn of the manner in which these epidemics are being combatted in Germany. I had the good fortune to be appointed "Assistent" in a laboratory established last summer for the specific purpose of studying, and, if possible, of cutting short the epidemic which was at that time raging in one of the districts of Elsass, and thus had an opportunity of observing, at very close quarters, the methods and theories of the movement against typhoid in Germany. That it is really a "movement," a national movement, undertaken in the spirit of a German army campaign, lends it an interest and an importance which hardly attach to the sporadic skirmishes with local epidemics, as they are carried on in all other countries, including our own, organized generally in great haste and frequently under quite unfavorable circumstances. In Germany, however, the entire machinery of the Imperial Government has been set in motion, and a very considerable fund has been made available, to carry on a continuous and well-planned crusade against the ravages of the disease; that the entire organization is under the control of such men as Koch, Flügge, and the Surgeon-General of the Army, gives some notion of its intention and of its efficiency.

It was toward the middle of July that I first received intimation through the Professors in the University of Strassburg that I might have the regular position of Assistent in a "field-laboratory"—or "fliegende Station," as they called it, on the analogy of an easily moved, temporary, army-garrison—which was soon to be established in Diemeringen, a village about 2½ hours from Strassburg. I had already had an opportunity of seeing how the work was conducted in the large permanent stations, with well equipped laboratories, situated in the midst of a great city, such as was the Hygienic Institute of the University of Strassburg. Of these there were at that time four in Germany, namely, one in Trier, presided over by Prof. Frosch; in Metz, by Conradi; in Saarbrücken, by von Drigalski; and in Strassburg, by Profs. Forster and Ernst Levy, all of them with perfect facilities, and a large body of assistants. Under such circumstances, the work differed only in details from that carried on by efficient boards of health in all large advanced cities. The conditions which were to be confronted by the new station in Diemeringen were, however, of an entirely different kind. Here was a squalid country village, of perhaps a thousand inhabitants, situated in one of the most neglected regions of the Empire, Elsass, which has alternately been the stepdaughter either of Germany or of France. Around this village, typhoid had become epidemic, and in some of the hamlets had attained the proportions almost of a scourge, or a pest, inasmuch as ten per cent. of the inhabitants were suffering from the infection. This was an opportunity for which the large plan on which the movement was organized had made provision, although no occasion had previously arisen to test its practicability. Diemeringen was to be the first, experimental, flying station. The epidemiology and bacteriology of the disease were to be worked out in an improvised laboratory on the spot, but according to exactly the same requirements and regulations as had been prescribed for the chief stations in the larger cities. That these requirements were by no means trivial will subsequently become evident. I was very much interested in seeing how this experiment would turn out, and therefore I determined to accept the position proffered me.

About a week was consumed in arranging all the preliminaries. A laboratory "Diener" had to be engaged, and taught the rudiments of his work. An initial stock of culture media had to be made up for use during the first few days. And, most important of all, a list of necessary articles had to be prepared, and sent to the firm of Lautenschläger, in Berlin, who were to forward the supplies as rapidly as possible to the seat of operations. Finally, however, everything had been arranged, and on one afternoon in the early days of August we set out from Strassburg, and betook ourselves to Diemeringen. Our "staff" consisted of Dr. Kirstein, first assistant to Prof. Flügge in Breslau, and previously assistant to Eberth in Halle, myself, and the laboratory Diener. We reached the village late that night, and it made upon me, at least, an impression which I shall hardly forget. There was neither carriage nor wagon to meet us; however, my host of the "Eisenbahn Hotel" had provided a man with a wheelbarrow, in which our belongings were trundled up to the hostelry. So, through the long,

narrow, winding street of Diemeringen, its only thoroughfare, we wended our way. On each side of us were the low shanties, which expressed the poverty of the inhabitants, and from which issued occasionally the grunting and lowing of the beasts that shared them with their human owners.

Our work now began in earnest. The Government had leased for our use a fairly large building, with two floors and an attic, and this was dedicated to laboratory purposes. Our home was in the hotel. The house was sufficiently large to enable us to set aside one room for the secretorial work, which was considerable in amount, inasmuch as the details of every case had to be recorded and tabulated; another room for microscopic work; a third room for the sterilizers; another, which was fitted by the local plumbers with a rude sink, as a washroom; and, finally, one as a home for our animals. It took no little pains to get things to rights for the six weeks' stay which we proposed to make. Furniture had to be supplied by the carpenters, and was designed by Dr. Kirstein, to be as simple as possible, and, at the same time, to be easily portable, since it was expected that the station with all its supplies would be transferred from Diemeringen as soon as its work had been accomplished there, to some other typhoid center, as was, indeed, subsequently done. The laboratory equipment, which had been gotten together by Lautenschläger, at a cost of between 3,000 and 4,000 marks, was in its way ideal for the purpose. We had expected great difficulty with incubators and sterilizers, knowing that there was, of course, no gas in Diemeringen. For the dry and steam sterilizers, the firm provided two petroleum apparatuses, known as "Juwel," of a type commonly used in Germany in the kitchen. They are so designed that the vapor, and not the petroleum itself, ignites, and they maintain an extremely high degree of heat for a considerable time. Thus, the hot air sterilizer could be heated to 180° F. within fifteen to twenty minutes, and the steam sterilizer could be kept in constant operation for a whole day without refilling. The problem of maintaining a constant temperature in the incubator by means of a petroleum lamp would appear to be almost insurmountable, yet with the form of lamp furnished for this purpose by Lautenschläger, I venture to assert that there was not a variation of three degrees during the whole period of our work. All the apparatus was of the most modern type. Our microscopes were two Zeiss instruments, of the type known as field microscopes, with a case of leather, which could be slung over the shoulder. It is needless to enter into all the details of laboratory supplies; suffice it to say that every need had been most anxiously foreseen and most carefully provided for.

Thus, within a very few days, we were in complete working trim, and in the full blast of our work. The problems and the tasks which confronted us were chiefly of two kinds—epidemiological and bacteriological, and I shall so divide the description of our work. The epidemiological investigation was done by Dr. Kirstein, whereas the greater part of the bacteriological work was done by myself.

In Diemeringen itself, there were, fortunately for us, no cases of typhoid. In at least four of the neighboring villages, however, the disease had broken out, and in Rathsweiler, about three miles away, it had stricken fully ten per cent. of the peasants. The system on which the investigation was organized had been planned in Berlin, and, it is safe to say, was such as could be inaugurated in no other country on earth. Besides ourselves, the machinery which was set in motion in order to render our work as complete as possible, comprise the so-called Bezirksarzt or Kreisarzt, the local physicians, the mayors, and the police. To one who is not acquainted with German conditions, especially such as prevail in the Reichsländer, such as Elsass and Lothringen, a few words of explanation are necessary for an understanding of the powers of these functionaries. The Kreisarzt is a physician appointed and salaried by the State, with functions somewhat similar to those of local boards of health, with the difference that his work is governed and controlled by a central bureau. The physicians stand to their patients in a relation similar to that which maintains elsewhere, but in an altogether different relation to the State. As is the case with so many other professions in Germany—notaries, apothecaries, and others—their number within a given area of territory is limited by statute; this fact tends to insure their practice and prosperity, but renders each physician rather dependent on the good will of the governing power. If he prove in any way disagreeable his position may be rendered very unpleasant, or the number of possible competitors may be increased, to his detriment. Thus the entire local medical profession could be induced to work in harmony with the ends of our investigation. It was enacted that every physician should immediately report every case of typhoid which came under his notice, every suspicious case, which manifested headache, malaise, or diarrhea, to the Kreisarzt of the district. The Kreisarzt was at once to forward his information to the Untersuchungsamt, our laboratory station, and then either he or the station was to take measures leading to the bacteriological identification of the case. In all cases occurring in the villages nearby, we procured the necessary material—feces, blood, and, in cases of pneumotyphus, sputum—in person; if this were inconvenient, the physician was requested to send us samples by the earliest mail, for which purpose specially contrived receptacles were put at his disposal. Of prime importance, of course, is the material for a Widal test, and for this purpose small bottles with rubber stoppers were provided, which could be inclosed in a special form of wooden box, and so safely transmitted through the mail; similar bottles, carefully secured against leakage were provided for feces. The bottles for feces were provided with a cork stopper, into which was fastened a small metal spoon, which reached about half way down to the bottom of the bottle. Bottle and cork were first sterilized. The fecal material was to be packed into the bottle by means of the spoon, and, in the subsequent examination at the laboratory, the contents were removed by a sterilized platinum loop. I mention these details in order to show what consummate care was taken to avoid even such a common accident as the chance contamination of the suspected feces. Physicians were requested to send at least 5 c.c. of blood, inasmuch as it was the rule to control the microscopical by the biological test. All of these regulations made it fairly certain that no case of typhoid could escape detection, and, from an epidemiological standpoint, this was an extremely important consideration. The relation of the mayor and police board to our work consisted chiefly in the enforcement of the necessary general hygienic measures, as will be subsequently detailed.

The first problem, and, it may be said, the chief epidemiological problem which had to be solved, was the question of the origin of the epidemic. I believe it to be not quite generally known in America that the present movement in Germany is based upon a theory which represents a violent break with the typhoid traditions of the past. It has long been, and is, at present, very generally believed that epidemics of typhoid fever are nothing more nor less than water infections. Indeed,

at the recent Städteausstellung in Dresden, in which an entire building was devoted to epidemiology, comparative statistics of previous typhoid epidemics seemed to show that at least 97 per cent. of these could be traced to contamination of the water supply, or of the milk, which amounts practically to the same thing. Nevertheless, an undercurrent of revolt against this theory has never been wanting. It has always been recognized that a certain number of cases get their infections, not from a common water-supply, but from direct contact with other victims of the disease. The most common example of this kind of infection is furnished by the nurses, who in "model" hospitals, such as that in Hamburg, become infected in a ratio of two per cent., while in some hospitals, such as the Prussian military lazarets, the infections may reach 8 or 10 per cent. Moreover, occasional epidemics have arisen, in which it has seemed impossible to lay the blame at the door of the water supply, as in that which occurred in a French garrison, if I remember rightly, in Algeria, in 1901, and which was attributed to the distribution by a wind storm of typhoid germs, which were supposed to have lain dormant in dried-up dung-heaps on a neighboring plain. Fanciful as this individual explanation may seem, the fact remains that the improvement in water supply does not appear to have worked with the same degree of magic as in the case of cholera. There is, for example, no case in typhoid literature which shows the same wonderful coincidence of the area of disease with that of a contaminated water supply, as did the Hamburg-Altona epidemic of cholera. Moreover, improvement of water supply has notoriously not exterminated typhoid. Thus, the city of Paris, which has of late years become a model in this respect, has still presented minor localized epidemics of the disease, a fact which could only be brought into harmony with the dominant theory by advancing the still more questionable hypothesis of contamination by "sources Vanelusiennes," or underground streams coming from a distant surface source, as suggested by Chantemesse. A new character has been given to all these problems by the recent announcement of Koch, that all typhoid epidemics must be considered in the light of an infection from man to man. The theory is, it must be admitted, not original with Koch. Musehold, at present Ober-Stabsarzt in the garrison at Strassburg, was the first, I believe, to assert that a certain garrison-infection could only be explained on this basis, and to combat it along lines logically deducible from this hypothesis. But to Koch, as in so many other things, belongs the credit of having firmly and uncompromisingly indicated the general principle. He maintains that the typhoid bacillus is for all practical purposes to be regarded as an "obligate parasit," that it does not maintain its existence outside of the body for any considerable time, and, consequently, that infections are practically from the excreta of one victim to the mouth of the next.

I am well aware that bacteriologists will have much to urge against the very fundamental premises of this theory of Koch's. One need only consult any complete article on the biology of the typhoid bacillus, such as Neumann's in Kolle and Wasserman's Handbuch, in order to convince himself that it is undoubtedly possible for the germs in question to live for a considerable period outside of the body. This, however, is not the point at issue, which must be decided by practical hygienists and clinicians rather than by the bacteriologists. It is simply the contention of Koch that the vast majority of typhoid infections do, as a fact, occur without the agency of a contaminated water or milk supply. It may very well be that his statement is too sweeping; one can hardly believe that the many epidemics which have, apparently with consummate care, been traced to the water supply, should all have been misinterpreted and misunderstood. Nevertheless, it is well to keep in mind that there are few problems more difficult and delicate than the unraveling of an epidemic, and the determination of such cases as have, presumably, received their infection from the water-supply as opposed to such as have received it by direct infection. The crux of the whole question lies in the fact that a careful investigation generally reveals that either mode of infection might, in almost any set of cases, be held responsible. The current of personal intercourse within a community, with all the possibilities which it furnishes for the direct conveyance and transference of the germs of the disease, is as all-pervading and as far-reaching as is the underground current of water. An honest investigator is, therefore, driven to rely wholly on such circumstantial evidence as the *course* and *progression* of an epidemic, which, as I have said, constitutes essentially a non-bacteriological problem. Certainly it is a very remarkable fact that the greatest clinicians of the "ante-Koch" era of medicine received for the most part an altogether different impression of typhoid epidemics from that which subsequently became established. Thus, the great Trousseau, in his collected clinical lectures, recites the history of a large number of epidemics, which seemed undeniably to have traveled from person to person. Most remarkable in this respect was the epidemic of 1855, in the village of Trombern, in which, says Trousseau, it was "a striking fact that the first case appeared in the first house to the northwest of the village, and that the epidemic then advanced step by step, from house to house, until it finally reached the southwestern extremity of the village. I have, however, wandered very far from my purpose, which was neither to defend nor attack any theory of typhoid, but to recite the facts as I observed them in Diemeringen and its vicinity. Be the theories as they may, I am very sure that the epidemics which we had occasion to observe illustrated the potency of contact infection to an extraordinary degree. Personally, I feel convinced therefrom that there will prove to be a very large element of truth in the statement of Koch, and that, just in such country epidemics as we had to study, contact-infection will prove to be at least a very important factor. I come now to a brief description of the epidemic in Rathsweiler, which will show in how far my assertions are justifiable. We may then best consider what constitutes, and contributes to contact-infection, under what circumstances it is apt to become effective, and how it may best be combated.

(To be Continued.)

SOCIETY PROCEEDINGS.

NEW YORK PATHOLOGICAL SOCIETY.

Regular Meeting, held December 9, 1903.

The President, William H. Park, M.D., in the Chair.

Notes on a Number of Mallein Reactions.—Dr. Letchworth Smith said it was the purpose of these notes to present as briefly as possible some of the results of examinations of a number of horses killed during the summer after having been tested by mallein. A reaction to mallein included three points: (1) General reaction—dejected appearance, staring coat, etc. (2) Local reaction—appearance of tender swelling lasting several days. (3) Rise of temperature. According to the Health Department Circular of Information regarding the use of mallein, this was "from 2.7° to 7.2° F.," while French and German authorities insist it

should be at least 3.6° F. to 2° C. The list of cases given did not include all the horses killed, but those which fulfilled the following conditions: (1) Tested by mallein during the months of March, April, May and June, 1903, and notes of the tests recorded; (2) condemned as result of tests; (3) autopsied and bacteriologically examined by Dr. Schwarz, Dr. Weil or Dr. Smith. The results were interesting on account of the temperatures, the part of the mallein reaction which usually claimed the greater share of attention. The temperature was taken five times in the twenty-four hours preceding injection of mallein and five times following it. The mallein was made by Ravenel's method. In estimating the rise of temperature during these tests, the average taken before the injection was compared with the average taken after it, rather than by comparison of the highest temperatures reached in each case. Of the 43 cases with conditions as above mentioned, 8 had shown a rise of 2° C. or more in temperature. Of these, 3 showed lesions interpreted as glanders, besides yielding the glanders bacillus; 2 showed indications of glanders, but the bacillus could not be isolated. Three seemed normal. In 22 cases of the 43, there was a rise of 1° to 2° C. Six of these were bacteriologically and pathologically proven to be glanders. Seven were pathologically positive. In nine cases there were no indications of glanders. In the 13 remaining cases the temperature rose less than 1° C. Four yielded glanders bacillus, 5 showed suspicious lesions and 4 were negative. Even in the cases in which there was a marked rise of temperature, more than one-third showed very doubtful lesions, or none whatever. As the foreign authorities would lead one to expect, 13 cases with temperature changes less than 2° C. were negative. But in the attempt to "stamp out" glanders, the destruction of normal horses was no more important than the mistake of passing over one having he disease. If the conservative course had been followed—of considering the cases negative if they failed to show a rise of temperature of 2° C.—10 horses from which the bacillus was recovered and 12 others which were very probably cases of glanders, would have remained alive, and been a possible source of infection. The speaker regretted that more reliance could not be placed on the negative reactions. Some cases put down as negative might have proven positive bacteriologically if the destruction of the horses could have been satisfactorily managed. It was impossible to get possession of material as soon as desired.

Dr. Smith spoke of the lack of knowledge of lesions which simulate glanders. The experience of the summer supported the position of those who consider mallein a favorable diagnostic agent in suspected cases of glanders rather than those who condemn it. Whether or not under ordinary circumstances the actual destruction of horses, which showed no symptoms of glanders except a reaction to mallein is justifiable, was still an open question. The later observations of Nocard, Babes and other authorities on the curability of the disease tended toward the more conservative idea of isolation until the appearance of more definite evidences that the animal is useless.

An Unusual Case of Multiple Neuritis.—This case was reported by Dr. Harlow Brooks. The patient was a woman, fifty years of age, born in Russia. Apparently there was no tuberculous, specific or neuritic taint in the family. At an early age she began to drink whisky steadily, but never to the point of intoxication. She also drank a little beer, tea and coffee, but not to excess. She married when twenty years of age, and from this time forward had various symptoms which reappeared from time to time. Her ankles became painful and swollen after exertion, pain disappearing after rest. She had attacks of diarrhea following periods of constipation, the latter lasting six or seven days. At forty years of age she was frightened and after this had headache, which lasted for a year and a half, but was relieved by domestic remedies. At the age of forty-one her ankles became so swollen and painful that walking was impossible, and she remained in bed for a time, after which she was able to walk about again. Because of painful callosities on the sole of her feet, she walked on the heels, which gave her a peculiar gait, which still persists at the age of fifty years. Two and a half years ago she noticed some anesthesia of the soles of the feet. This was not permanent, but remained for a week or two, and then disappeared only to return again. Two years before her admission she had lumbago, with severe and persistent pains in the wrist. She lost control of the bladder for nine months, when she recovered completely. During her last illness of nine months' duration, she suffered from pain in the larger joints of the body, was very weak, could do no housework, and remained in bed much of the time. She had no control over urination and defecation. Pains in the back were very severe, also pains in feet, arms and shoulders, when she could not raise either her hands or feet. After six months in bed with intervals of improvemnt, she was able to sit up without help. When examined at the hospital the muscular dexterity was impaired, myotactic irritability was wavelike, there was no perceptible enlargement of the superficial lymph-nodes. She showed no mental weakness, was good natured, and complained very little of the pain from which she apparently suffered. The muscles were flabby and normal in volume, except for a slight wasting of the small muscles of the right thumb. Sensibility as to pain, touch and temperature normal. When two fingers were placed upon the arm, she recognized four, usually increasing rather than decreasing the number of points. Reflexes were exaggerated, motor power diminished. Slight foot drop was noticed when the patient was in bed. The patient developed a bed sore, grew rapidly worse and died. Postmortem showed the lesions of a long-standing case of alcoholism of the chronic type. The brain was abnormally firm. The spinal cord was firm in spots in other places it was soft. No apparent changes in the retina. Anatomical diagnosis was peripheral neuritis probably of alcoholic origin. There was interstitial hyperplasia in all the organs. In the brain, spinal cord and nerve roots, it was found that the cortical fibers coming from the large pyramidal cells of the frontal and parietal regions of the cortex were extensively degenerated. The fibers were also degenerated in the internal capsule, the medulla and the spinal cord showed a marked descending degeneration most marked in the crossed pyramidal tracts. As she expected, degeneration of the posterior tracts was found, but it was more extensive than anticipated. There were, however, no distinct areas of sclerosis. The posterior root ganglia showed cytoclastic changes and both posterior and anterior nerve roots were extensively degenerated. In the peripheral nerves there were interstitial and parenchymatous degenerations more prominent in the smaller trunks, less so in the larger. Presence of the descending degenerations was most interesting. These degenerations were present without marked mental change as though the motor fibers were particularly affected, and yet in the so-called psychic areas sections showed some degenerated fibers. The speaker thought it rare in cases of alcoholism producing degeneration in the brain, cord and peripheral nerves, to find the descending degeneration fully as marked as the ascending changes.

He thought the lack of knowledge of these brain changes was due to the fact that observers had been satisfied on finding the changes in the peripheral nerves and did not search further for alterations in the brain.

Dr. M. G. Schlapp, in the discussion, said that two years ago he had shown a case of so-called alcoholic neuritis in combination with mental symptoms (Korsakow's syndrome) to the Pathological Society, in which there had been marked changes in the spinal cord and medulla. The brain of this case had not been examined up to the time of the presentation, but later he examined and found changes throughout the cortex. This case differed from the one of Dr. Brooks, in that the mental symptoms were very marked. The point brought out by Dr. Brooks that these changes had not been observed in similar cases of alcoholic poisoning before, is very likely due to the fact that in examining these cases former observers did not use a method whereby acute degenerative changes, such as are found in alcoholic poisoning, are made visible. These changes are demonstrated by the Marchi method. The lesion as a rule is the result of an acute or subacute condition. It does not involve whole tracts, but only groups of fibers in certain tracts, particularly the fibers in the posterior root zones of the spinal cord, and the intramedullary fibers of the sensory cranial nerves. The speaker agreed with Dr. Brooks, and wishes to lay special stress upon the statement, that it is very likely that in all those cases of so-called alcoholic neuritis, the lesion is not confined to the peripheral nerves, but is also found in the central nervous system; in fact, in all the cases examined by the speaker, five cases of alcoholic neuritis with mental symptoms (Korsakow's syndrome) the lesion was more marked in the cord or brain than in the peripheral nerves.

A Patent Foramen Ovale and a Case of Multiple Serositis.—These cases were demonstrated by Dr. J. E. Welch. In the first case the patient was an Italian boy of sixteen years, who could not give an account of himself in English. He had dyspnea and edema of the legs, which gradually spread over the body and became general. The principal symptom was great pain over the precardial region; so great that he requested another Italian in the ward to give him some instrument with which he might commit suicide. Autopsy showed heart greatly enlarged on the right side, hypertrophied and dilated. Deposit of recent fibrin over right auricle and ventricle and about apex. All valves were thickened, tricuspid and mitral to a much greater extent than the others. The patent foramen ovale was of enormous size—1½ inches in diameter; just beneath it was another and smaller opening.

In regard to the second case: In 1846 Van Deen reported a case with the following findings: Obliterating pericarditis, pleurisy with adhesions obliterating both pleural cavities. Inflammation of the peritoneal cavity causing general thickening of the peritoneum, with marked thickening over liver, spleen and the intestines. This case had constant ascites with edema of the legs subsequent to the ascites. Van Deen's theory was that the obliterating pericarditis was the primary lesion and that the inflammation spread to the pleural surface, thence to the abdominal cavity. Since then many cases have been reported. Dr. Wood, of Philadelphia, in the *American Journal of the Medical Sciences*, January, 1903, showed that a constant feature was an ascites, the serous membranes throughout thickened with obliterating pericarditis. The principal point is the fact that ascites appears before the edema in the legs in a great majority of cases. There is no change in the liver, except in a few cases that would account for the ascites. In the case Dr. Welch reported, the patient was a stableman aged thirty-five years; was alcoholic; took five or six glasses of whisky a day, one or two before breakfast, and enormous quantities of beer. Had had gonorrhea several times. Twelve years ago had chancroids, followed by suppurating inguinal adenitis. Was never ill before. November 1, 1902, cramplike pains all over the body which soon localized in the upper part of the abdomen which became swollen and tender. Physical examination showed that he had ascites with swelling of the legs, the heart had a rapid, feeble action. There was some increase of tension in the arteries, which were small in volume. Somewhat cyanosed; no jaundice. Directly after admission to the hospital a general syphilitic rash broke out. He then admitted having had a hard chancre, which had healed five weeks previously. He was dismissed from the hospital December 12, 1902, feeling much improved, and was treated in the Dispensary until the first of March, 1903, when he began to have swelling of the abdomen, with pain; about two weeks later had dyspnea and edema of the legs. He entered Bellevue again on March 15, two or three weeks after his trouble began. A short time afterward he was tapped, and a large quantity of fluid was drawn, which was of the nature of a transudate. He was tapped at intervals until just before his death, which was in the early part of August, 1903. Autopsy showed (membranes of brain not examined, as permission to do so could not be obtained), obliterating pericarditis. The right pleural cavity contained firm. old adhesions, about the base of 300 c.c. of serum, the left contained firm adhesions to the posterior border of the lung, and about the base, three litres of serum. Had perihepatitis (sugar-coated liver), perisplenitis (sugar-coated spleen), and general diffuse thickening of the peritoneum. There were a few slender, firm, cordlike adhesions between diaphragm and upper surface of liver, both lobes; also between the stomach and transverse colon, tubercles in the lungs and in the bronchial lymph glands; few in the spleen, none in peritoneum or liver. Liver cirrhosed, inter and intralobular connective tissue. There were 4,000 c.c. of turbid serum in the peritoneal cavity. There was complete obliteration of the great omentum and gastrocolic omentum, and free communication between the greater and lesser peritoneal cavities. Cause of condition, probably alcoholism, syphilis and tuberculosis; tuberculosis in the peritoneum not included in this case. That is also given as a cause by some writers on the subject.

Dr. E. Libman, in the discussion, asked Dr. Welch if there had been any positive venous pulsation; the combination of a mitral insufficiency with an open foramen ovale usually produced it. He said he had looked up the records of the hospital; in the last hundred autopsies there had been thirteen cases in which the foramen ovale had been more or less open. They had occurred at all ages from three months to forty-four years, and had not shown any clinical symptoms that could be referred to the foramen ovale. Ordinarily this condition did not seem to produce clinical symptoms, unless combined with other congenital or acquired lesions, or particularly in infants with diseases of the lung causing interferenee with the circulation. In the case reported by Dr. Welch the opening was very much larger than he had ever seen.

Dr. Welch replied that there was a venous pulsation in the vessels of the neck and there was also a very distinctly pulsating liver.

Dr. Brooks said the case had been very carefully examined in the ward, and the lesion had not been classed as of the foramen ovale. The man arrived from the steamboat and diagnosis could not be made out. The trouble was thought to be a double mitral lesion and

possibly tricuspid. There were so many murmurs they could not be localized as coming from any one place.

Paratyphoid Infection.—Dr. George A. Tuttle reported a group of seven cases of paratyphoid infection, four of whom, a mother and three children, entered the Presbyterian Hospital. They were all taken ill about the same time with symptoms suggesting typhoid fever. Three of the cases recovered. The mother died. In no case was an agglutination reaction obtained with the typhoid bacillus. From the tissues of the patient who died, pure cultures were obtained of bacilli, which formed typical colonies when grown in the Hiss medium. They did not coagulate in milk nor produce indol. No gas was formed in lactose bouillon. They fermented glucose with the production of gas. They were motile and resembled morphologically typhoid bacilli, but there was no reaction to strongly agglutinating typhoid serum. The blood of this patient and that of the other three cases clumped four out of six specimens of paratyphoid organisms obtained from the Laboratory of the Board of Health from different sources. Examination in the fatal case showed that the lungs, heart and liver were normal. The gall-bladder contained a number of fairly large calculi, one of them forming a sort of ball valve in the cystic duct. The gall-bladder was filled with a viscid, light colored fluid. The wall was thickened and had evidently been the site of an old cholecystitis. The spleen was soft, pulpy, and weighed 6¾ ounces. The kidneys weighed 6¼ ounces each, with nothing to indicate any chronic disease. The cortex was pale and there was considerable congestion. The intestines showed Peyer's patches normal, except in the lower two inches just above the ileocecal valve. Here there were four or five small ulcers, the largest one, one-half inch in diameter. They were punched out and were rather deep, some reaching the peritoneal layer. The lower part of the small intestine and the entire large intestine were filled with blood. Living on the same floor with this family was another family of four persons. At least three of these people were taken ill in the same manner at about the same time. These two families lived on the top floor of a tenement house, and obtained water from a tank on the roof into which the water was pumped from the cellar. They obtained milk from different sources and it seemed probable that the water was at fault. However, it had been examined and nothing found. The blood from one of the cases in this second family was obtained through Dr. Park, and it gave a prompt agglutination reaction, with the paratyphoid bacilli isolated from the fatal case in a dilution of 1 to 60, but did not agglutinate with typhoid serum. This group of seven cases is considered as paratyphoid.

Dr. C. W. Field said he wished to say a word about the tank on the roof mentioned in Dr. Tuttle's report. It was built last year, and was made extra large, the owner thinking he might make a deal with the owner of the next house, and have the four top floor tenants supplied with water from the same tank. This could not be done, and this large tank was pumped full, the water allowed to remain without freshening until all used. In this way when water was low, it became offensive, nearly black, filthy and dirty, as both families assert. The husband in the other family refused to drink it; he drank beer instead, and remained well. In this family there were five members, of whom three became ill. A man caller came frequently during the month of August and drank considerable water during evening. On October 7 he developed a disease which was diagnosed as typhoid in Yonkers. He recovered. He had temperature when taken ill of 104½° F. All symptoms corresponded closely with the group reported, and without doubt he had been infected from the same source as the others. All recovered within about four weeks from the beginning of the attack.

Dr. Park said the only people attacked were those who used the tank water. Out of a possible thirteen, eight became infected. There were seven or eight other families in the house, with no cases of the disease whatever.

Dr. Libman wanted to know what sort of serum was used which refused to agglutinate the bacilli from these cases, but did agglutinate typhoid? He wanted to know also what the reaction of the bacilli was in glucose media.

Dr. Tuttle replied that when it was found that the bacilli did not produce Widal with the ordinary typhoid, they were tested with the glucose medium. In twenty-four hours there was a very faint bubble of gas. In forty-eight hours there was abundant production of gas; no gas in lactose.

Dr. Brooks asked if the ulcers looked like typhoid, and what was the condition of the peritoneal lymph-nodes.

Dr. Tuttle replied that they looked like some typhoid ulcers, and that no observations had been made of the peritoneal lymph-nodes. In his experience Peyer's patches had been irregularly distributed in this neighborhood. There were punched out ulcers in the mucous membrane, with no evidence of Peyer's patch around them. If the patch had been there it was all gone. The ulcers were in just about the area where one would expect to find the patches—within two inches of the ileocecal valve. He also said in regard to the microscopic appearance of the bacteria in the hanging drop they did not look like typhoid bacilli, and did not act like them. They appeared to be shorter, often double and frequently were in long strings, almost like streptococci. After staining they looked like typhoid, but were markedly different in the hanging drop.

Dr. Park said the cases were interesting, as the woman who had died had been engaged in cleaning up a great many typhoid cultures at the Research Laboratory, and it had been suspected that she had become infected in the laboratory. If the disease had not been proven to be tank infection and paratyphoid it would have been hard to make it clear that she had not been careless in working at the Department of Health. This showed how misleading apparent evidence might be in many cases.

Precipitins.—Mr. J. P. Atkinson read a preliminary note on precipitins formed by injecting animals with globulin derived from normal horse serum and from horse serum containing diphtheria antitoxin. The experiments were devised to see whether in animals injected with the globulin of normal horse serum and with the globulin of diphtheric antitoxic horse serum were developed anti bodies which would act as a specific precipitin for normal horse serum globulin, and for the antitoxic horse serum globulin, respectively, thus affording a method for separating the active substance in diphtheria antitoxic serum from the inactive substance. Globulin solutions were prepared from normal and diphtheria antitoxic sera by precipitation with magnesium sulphate and were purified by solution and reprecipitation until free from serum albumin and finally were freed from magnesium sulphate by dialysis. Chloroform was used to prevent putrefaction. Two rabbits were selected for immunization, one being injected with the solution of normal globulin, the other with the solution of antitoxic globulin. After a number of injections had been given each rabbit they were bled and the sera from the clots were tested against

diphtheria antitoxic serum with the following interesting results:

Two samples of diphtheria antitoxin which had just recently come into the laboratory to be tested were diluted so that 1 c.cm. of the dilution contained one-tenth unit of anitoxin. Two portions of 5 c.cm. each were taken from each dilution and to them was added serum from each rabbit, so that the globulin in each antitoxic horse serum was acted on by what we may call an antinormal globulin serum and an antitoxin antiserum, which should react for both normal and antitoxic globulin. After precipitation had taken place the precipitates were filtered off. An amount corresponding to 1 c.cm. of the original serum dilution from each filtrate was mixed with ten fatal doses of diphtheria toxin and injected subcutaneously into guinea pigs. All the guinea-pigs died within forty-eight hours after inoculation.

The antitoxin dilutions were tested against diphtheria toxin, to make sure that without the presence of the rabbit sera these antitoxins would protect against ten fatal doses of diphtheria toxin. The toxin was also tested and found to be of the estimated strength. The action of both rabbit sera was again tested. In this experiment twice as much antitoxin as was necessary to protect against ten fatal doses of toxin was used, instead of the exact neutralization dilution. The result was the same. Both guinea-pigs injected died within forty-eight hours. It will be seen by these tests that a specific antibody differentiating between normal globulin and antitoxic globulin was not found, for the rabbit injected with normal globulin solution produced precipitating substances for the antitoxic globulin.

One would infer from the results of these tests that normal globulin and diphtheria antitoxic antiglobulin are affected by a common precipitin, while differing in the molecular arrangement through which neutralization of diphtheria toxin occurs. It also adds to the belief that diphtheria antitoxin is of a proteid nature. Experiments were made to determine whether he globulin precipiating serum would throw down the antioxin from the toxine antitoxin and leave the toxin free. It did not do this and thus showed that a strong combination existed between the toxin and the anitoxin. Whether the toxine antitoxin combination, as well as the free antitoxin was precipitated or whether it was left in solution is being now determined.

Dr. F. C. Wood said that he did not think it was justifiable in our present state of knowledge concerning the precipitins to expect that the reaction would be in any way sharply limited to the antitoxin. From his own experiments and those of others it had been shown that the blood of an animal immunized with a pure proteid, for instance, a serum albumin from human chest serum, would give a serum which precipitated not only human serum albumin, but globulin and even hemoglobin.

It was still doubtful whether the hemoglobin, for example, was actually precipitated by the antibody, or whether it was carried down mechanically with the precipitum from other proteids present. It seemed to him also that the assumption from precipitin tests alone that diphtheria antitoxin was of proteid nature lacked foundation, especially after the results obtained by Jacoby in isolating the toxic group from ricin. Apparently the toxin in this case, though it could be precipitated by means of neutral salts, yet was not of proteid nature, but only attached to the proteid molecule. The contradictory results obtained by Obermayer, Pick and Michaelis showed that there was much to be learned about the exact chemical nature of the precipitated substance.

THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON DISEASES OF CHILDREN.

Regular Monthly Meeting, held December 10, 1903.

The President, Henry Heiman, M.D., in the Chair.

Hypertrophic Cirrhosis in a Child.—Dr. Samuel Evans presented a child about six years of age suffering apparently from hypertrophic cirrhosis of the liver. The family history is good and the personal history has the single significant element that the child was given a little beer when it was about two years old with its meals but never any other alcoholic liquor. The family are accustomed to take beer and wine freely at their meals. The first sign of illness was an enlarged abdomen with a wasting of the rest of the body. When the little patient came under treatment, though it looked pale, there was no anemia, that is, no deficiency of hemoglobin, or of number of red blood corpuscles. There has never been any jaundice present and there are no venous stigmata anywhere in the body. Urine is of high specific gravity and contains a little albumin. The stools have been regular with slight amounts of mucus occasionally. There has been no hemorrhage from the bowels. On percussion the liver is found to extend from the fifth interspace of the axillary line to three inches below the border of the ribs. The spleen is not palpable and has never been palpable even with the child in the knee-chest position. While the case contains some elements pointing to hypertrophic cirrhosis, there is an absence of the ordinary causes. Two cases have been reported in which patients though not taking alcohol drank coffee to excess. If, as has been recently thought, it is the gastro-intestinal disturbance produced by the alcohol, rather than the alcohol itself, which brings on the cirrhotic condition, it is possible that coffee producing similar disturbing symptoms, might have a like effect. In the present case coffee has been used very freely and there has been more than a suspicion that that was the causative agent. In answer to a question by Dr. James J. Walsh as to the employment of specific treatment in the case, Dr. Evans said that mercury had been used and improvement seemed to follow its use. The gastro-intestinal condition was better than before, there seemed to be less ascites and the child's limbs seemed to be gaining in flesh. The treatment consisted in small amounts of calomel given every day and the coffee has been given up completely.

Purpura Hemorrhagica.—Dr. Stowell described two cases of this disease recently under observation. The purple disease of the skin or the viscera is due to small hemorrhages in these organs and when the hemorrhages occur in the joints then it is spoken of as rheumatic purpura or Schönlein's disease. When there is blood in the stools it is spoken of as Henoch's disease. In Dr. Stowell's first case there was blood and mucus in the stools and some bloody vomit. There was considerable fetor of the breath, hemorrhagic spots occurred over the entire body. Medication seemed to have very little effect, though tannin, bismuth and the various astringents, as well as antiseptics were employed—all failed. In the second case the patient had green watery stools later streaked with blood. The temperature rose to 101.5° F., the pulse to 132 and the respirations to sixty. Pneumonia was suspected, but the fever fell to 97° F., after which the bloody stools stopped, but the purpura continued and death ensued. At the autopsy no dysenteric bacilli were found and there were no agglutinating properties demonstrable in the blood. The lungs were normal. Ecchymoses were found on the pericardium, in the mucous membrane of the cecum and intestines as well as in the liver.

Etiology of Henoch's Purpura.—A number of similar cases have been described by authors in Europe and America, but there is a great variety of opinion as to the cause of the disease. Some have attributed it to a lack of potassium salts in the blood; others to a lack of blood plaques. Henoch considered it a vasomotor disease. In recent times many have attributed it to a bacillary cause. At least one supposedly specific bacillary cause has been found in the blood. The blood usually shows the appearance of secondary anemia, but is often absolutely normal. This was the case in both of Dr. Stowell's patients. In a group of cases, a pig suffered from the disease and the owner, the swineherd, and a girl who took care of the animal, all contracted it. The disease is common in swine. The petechia in Dr. Stowell's cases were quite different from those hemorrhagic patches which occur in wasted children, especially when the skin is loose. Dr. Stowell has seen one of these cases not very long since where the baby was suffering from marasmus, although entirely breast-fed.

Dr. Henry Heiman, in discussing these cases, said that the blood is usually found normal in these cases. Hence the disease is probably due to a microbe, or even more likely to a deficient intima of the blood vessels.

Bronchopneumonia.—Dr. Bovaird said that at the Foundling 40 per cent. of the deaths are due to this, only two per cent. to lobar pneumonia. This does not give the absolute proportion, but it suggests the relative frequency. Children never die in the primary stage of simple congestion, but always in that of red or gray hepatization. At times a lobe is found only partly consolidated, a true lobular pneumonia. Often there is a heavy deposit on the pleura, sometimes greenish in color, plastered over the lung. At times small abscesses may be found. In bronchopneumonia, the lung shows a red, shiny section, not granular, as in lobar pneumonia. The bronchi project above the surface and pus may be pressed out of them. The appearance is often mottled or dappled dark gray with cellate trefoil or clover-leaf figures Empyema is more frequent than is thought. The bacteriology of lobar pneumonia is well established. In 95 per cent. of the cases it is due to the pneumococcus. It is now known that the pneumococcus of pneumonia is also in the circulation. The Klemperer's, twenty years ago, could not find the bacilli in the blood. Later Aufrecht found it in 20 per cent. of the cases. Now bacteriologists find them in practically all the cases. Hence the disease is a general infection with a localized lesion. Bronchopneumonia is due to a mixed infection, the commonest causes being the streptococcus or the bacillus of Friedlander.

Diagnosis of Pneumonia.—Dr. William P. Northrup said that the most important element in the diagnosis of pneumonia is its early recognition. What then are the signs by which an experienced matron in a children's hospital suspects the beginning of pneumonia? Not infrequently, at the Foundling Asylum, the matron will go up to a nodding child and put it to bed saying that it probably has pneumonia, when the ordinary physical examination will show as yet no signs in the lungs. As a rule the child with developing pneumonia first refuses breakfast. Sometimes it vomits then it ceases to play and at times becomes bluish. The onset is rather abrupt and there is a dopy, chilly, shivery appearance about the child. When examined it proves to be hyperesthetic and shrinks from the stethoscope. The fever in these cases will sometimes be found as high as 104° F. at the very beginning. The ordinary pulse respiration ratio is 1 to 4. When this is disturbed the physician should always look for an affection of the lungs. An increase of respirations to 40 with a pulse of 140 nearly always means pneumonia. The first physical sign that is noted is a shower of râles. Then there is diminished respiration and diminution of the bronchial sounds, both voice and breathing. Cough is inconstant and is of little value, bing dependent on the catarrhal condition of the upper air passages. Dulness is the last sign that occurs. The child is usually lethargic and somnolent owing to the toxemia. Not infrequently there is a little stiffness of the neck and arms in children suffering from pneumonia, owing to the fact that the muscles surrounding the thorax are put at rest by nature. This may make it a little difficult to differentiate from tuberculous meningitis, but the facial expression is very different in the two diseases. Tuberculous meningitis has an expressionless mask, pneumonia gives a drawn face. The important differential sign, however, is the disturbance of the pulse, respiration ratio. As a rule, nurses do not take the respirations of the patients under two years of age. This is important, however, and they should be instructed to do so. At times a central pneumonia may give no physical signs, and the only method of making the diagnosis will be from the appearance of the patient and the disturbance of the pulse respiration ratio. Not infrequently diagnoses made from this symptom alone are confirmed by a frank crisis followed by satisfactory convalescence.

Treatment of Pneumonia.—Dr. J. W. Winters said that lobar pneumonia is practically never fatal in children and that the main element of any treatment must be surely to do no injury, or to disturb the patient. Whatever treatment is instituted must have due regard to the individual peculiarities of the patient. It is important that children suffering from pneumonia should be kept in a comfortable warm room, at a temperature of about 72° F. At the society for the Prevention of Cruelty to Children, where many cases have been under treatment, no deaths have occurred, but the question of an equable temperature is considered so important that a special night engineer is employed so that the temperature of the room shall not sink during the night. A cold skin leads to contraction of the cutaneous vessels, throws more work upon the heart, causes a congestion of the vesceral vessels and especially of the weakened vascular system of the diseased lung. It must not be forgotten that nearly 80 per cent. of the heat radiated from the human body passes directly from the sin. Ten per cent. more goes through this same tissue by evaporation. The control of the cutaneous vessels is extremely important, whenever there is any disturbance of temperature.

Contraction of Cutaneous Vessels.—Any contraction of the cutaneous vessels causes the internal temperature to rise. Exposure to cold or douching with cold water, far from bringing down the temperature, tends to increase it. There are many physicians, however, who seem to harbor the idea that temperature can be directly controlled by exposing a sick baby to cold. One night last winter, Dr. Winters was asked to see, in consultation, a child suffering from pneumonia and found the baby absolutely naked in a cold room, with the window open. The physician said that he had been absolutely unable to reduce the temperature which was about 106° F. Dr. Winters suggested wrapping it in flannel from head to foot, prescribed large doses of niter and a small dose of Dover's powder. The physician was to remain with the child during the night and improvement began at once, as soon as the condition of the skin allowed the patient to give off heat rather than accumulate it. Exposure, whether to cold air or to cold water, causes an intense disturbance of the nervous system. Whenever there is fever, nervous phenomena are likely to be marked in children, hence the

muscular agitation often seen in febrile conditions. The nervous reflex from a cold skin causes violent inspiration, bringing the accessory muscles of respiration into play and seriously disturbing the child. Usually the child respires by means of its abdominal muscles and there is no disturbing expansion of the thorax. In pneumonic conditions this natural condition should be encouraged, but cold applications have a directly opposite effect. Ice is used in the treatment of pneumonia in certain institutions for children, but this remedy certainly could not be employed in private practice among intelligent people and, as a matter of fact, it is unwarranted, since there is no good reason for it. Without any use of cold or cold applications the pneumonias at the rooms of the Society for the Prevention of Cruelty to Children constantly improve and the mortality is nil. Dr. Winters considers that Dover's powder is an important remedy in the treatment of pneumonia, especially at the beginning, when there are irritability and unrest. The true Dover's powder, however, should be employed and not that made according to the modern formula, which druggists usually supply. As Dr. Dover originally wrote the prescription it should contain opium, ipecac and sulphate of potash. For the sulphate of potash sugar of milk has been substituted in recent years, to the great detriment of the effectiveness of the remedy. Sulphate of potash is diaphoretic. The new form of Dover's powder induces constipation and brings on nausea. As is well known, any disturbance of the gastro-intestinal tract in children suffering from pneumonia, may easily prove serious since abdominal conditions so readily interfere with respiration. Modern Dover's powder does harm rather than good. Dr. Winters does not think that any of the coal-tar products should be used. When an antipyretic is needed, aconite to its physiological effect is the best drug and has no bad after-effects and produces no complications because of special idiosyncrasies. It should be given as the conditions indicate. During the fever of pneumonia, children are often very thirsty. In order to quench their thirst, they will take milk even though they may have no craving for food at all. If more milk is given than can be readily digested it produces abdominal distress and gives rise to gastro-intestinal fermentation and consequently interferes with respiration. This is the most serious thing that could possibly happen in a pneumonia case, since it is well known that any meteorism soon interferes with regular respiration and makes the outlook serious. The child should always be given all the water that it can drink, but should not be tempted much with milk until sure that the thirst has been relieved. The tongue is the most important factor in estimating the condition of the patient. A good clear tongue means easy descent of the diaphragm.

Alcohol and Other Drugs.—Alcohol is almost never needed in lobar pneumonia. In feeble children with irregular pulse, especially about the time of the crisis it may be of assistance. It must not be forgotten that pneumonia does not end by crisis near so frequently in children as it does in adults. When alcohol is employed it should be given by the rectum, sufficiently diluted with hot water as not to produce any irritation. When given by the mouth it often induces vomiting and is a frequent source of gastro-intestinal irritation. Strychnine should not be employed on general principles, but should be given for special indications about the time of the crisis. It should be given nearly always hypodermically. As a rule, no drugs should be given by the mouth. In septic conditions oxygen should be employed freely and the little patient's condition should not be allowed to sink too low before it is used. Properly employed, it is equal in value to whisky and strychnine.

Insidiousness of Pneumonia.—Dr. Rowland G. Freeman said that the diminution of the respiratory murmur is a valuable early sign of pneumonia and changes in this during the course of the disease show the development of pleural exudate or beginning empyema. Often there are no definite physical signs of a pneumonia and throughout the course of the disease there is apparently only a bronchitis. Sometimes the existence of a respiratory grunt is the only thing beyond the symptoms of bronchitis. It is only as the temperature comes down that the pneumonia consolidation makes its appearance at the surface of the lung and gives physical signs. It is probable that many cases of pneumonia are missed. Strychnine is well borne by children as a rule and should be employed in considerable doses. The use of alcohol would better be put off until near the crisis.

Nitroglycerin and Digitalis.—For cold extremities there is no better remedy than nitroglycerin. Digitalis is very valuable in conditions of heart disturbance but it produces so much irritation of the stomach, that it is often of doubtful service.

Dr. Charles G. Kerley said that the most important element in the treatment of children suffering from pneumonia is rest. Mother and nurse are directed that the child must be left in its crib, not taken in the arms, or held on the lap. The room must be kept at a temperature of 70° F., and once a day, usually about four in the afternoon, the child must be transferred to another room and the ordinary sick-room kept open for an hour in order to be well aired. Needless to say, the child must not be brought back to a cold room. The temperature must have reached 70° F. again before the child is returned. The air is important, so that a window must always be kept open, though the current of air must be so guarded as not to chill the room. The child must be warmly dressed, but protective dressing on the heart, such as oiled silk, only makes the child uncomfortable and irritable and hampers thoracic movement and consequently respiration.

Hygienic Measures.—The food must be reduced and, while the child is given plenty to drink, it must not be tempted to eat. A standing order is given that the child shall have an enema every twenty-four hours if there is no stool. The feet must be kept good and warm to make the circulation easier. No special drug is of any benefit and unnecessary drugging may easily do harm. Drugs must be given only when indicated. This holds good for strophanthus and strychnine and other stimulants as well as for less defensible remedies, for they must not be given on general principles. Digitalis is all right in theory, but it always disturbs the stomach. The gastro-intestinal tract must be kept in good condition at all hazards, for any irritation here causes interference with the action of the diaphragm and disturbs respiration. When the child's temperature runs high and the little patient becomes very restless, then a cold pack is the best possibly remedy. The arms and legs should be left free, but the child's thorax, should be wrapped in a large bath towel. In this Dr. Kerley takes direct issue with Dr. Winters, though he does not consider that the child should be shocked, or that it should be wrapped entirely in cold cloths. To cover the child entirely with a cold water bandage is surely to do harm. The pack may be put on at 90° F. and gradually the temperature of the water which is poured on the towel, may be reduced. As soon as the temperature reaches 101° F. the pack must be removed and then reapplied if necessary. There is no

special temperature for all patients. In some 90 degrees is suitable in others 50. In bronchopneumonia the same indications hold, though in this affection it is important to watch the gastro-intestinal tract, as the child may be ill for weeks at a time.

Bronchopneumonia.—In slow running bronchopneumonia counter-irritation is often of very great service. A poultice consisting of mustard one part and flour two parts, may be applied and kept on for from ten to fifteen minutes, or until the skin is reddened. Individual patients differ in their susceptibility to the influence of mustard, so no hard and fast rule can be given. This may be reapplied in from four to six hours, if necessary. There is an easiness of breathing and a softness of the cough that follows this treatment. Steam inhalations are also of value and if a little creosote is added to the steam it has an excellent effect. Twenty drops of creosote should be dropped in a quart of water and the child placed in a tent, allowed to breathe this for half an hour at a time, or, in severe cases, even an hour or an hour and a half. Oxygen is of great service when dyspnea is marked but the inhalation of the gas should not be continuous, as its intermittent inhalations for two or three minutes with two or three minutes of rest seem to do much more good.

Individuality of Treatment.—Pneumonia is a self-limited general infection, the complications of which cannot be prevented, nor the course shortened. The indication then is for supporting treatment. There is no per se treatment of pneumonia, but each little patient must be carefully studied. Cold is undoubtedly detrimental. The rules for the treatment of fever in adults do not hold in children. Some children stand the temperature of 104° F. very well. The physician's mainstay in the treatment of fever must by hydrotherapy. The coaltar products should be tabooed. Quinine is at times of excellent service, quiets the patients and gives sleep. Water must not be used cold in the treatment of children, for they do not react well and are disquieted thereby. Patients should be rubbed with lukewarm water, first gradually reduced in temperature, followed by a certain amount of alcohol. The idea is not to reduce the temperature, but to stimulate the heart and kidneys and the internal circulation and to soothe the nervous system. The temperature must not be knocked out or the patient will also be knocked out. As a rule, very few drugs are needed in lobar pneumonia and the fewer that are used the better. Inhalations, in Dr. Koplik's experience, have never done good, since they exclude fresh air and seem to cause cough. Moisture seems to have a like effect. Poultices should not be used as they weigh down the chest. In cases of accumulation of pleuritic fluid, puncture to remove it is inadvisable, unless absolutely necessary. The struggle and excitement incident to even such a slight operative procedure always do more harm than good.

Dr. Stowell said that steam inhalations in his practice have always seemed beneficial. In the three classes of patients that have come under his care, children in hospitals, in the tenements and in the homes of the well-to-do, though treatment has been very differently applied, in its faithfulness the results have been nearly the same. In the hospital the doctor's directions are absolutely followed, in the tenements they do what they can, in the homes of the wealthy they do what they please. The mortality in all cases is about the same. This is evidently an argument in favor of simplicity of treatment.

Absence of Cough.—Dr. Walter Lester Carr said that cough is usually wanting in children suffering from pneumonia. Though there is often an expiratory effort which the nurse may call a tickling. In most cases of pneumonia among the children the complication that occurs is gastro-intestinal more than cerebral and the possibility of mistake in diagnosis on this account must be remembered. Cold is badly borne by children and there must of course be no question of the plunge bath, no matter how high the temperature. Lobar pneumonia causes very little necessity for drugs, but bronchopneumonia requires the greatest of care to meet the indications of the individual case.

Steam Inhalations at the Babies' Hospital.—Dr. Kerley said that in the new Babies' Hospital a special room for steam inhalations, the steam being supplied from the heating apparatus, has been constructed. It is considered of the greatest possible service, indeed almost indispensable in the treatment of bronchopneumonia and bronchitis.

Dr. Dessault said that as pneumonia is a self-limited disease, the mortality is very low and the prognosis of cases can often be judged from the occurrence of albumin in the urine. The outlook is always unfavorable when albuminuria is present. Dr. Fenwick, of London, has applied this same idea to adults and finds it of very great value. The presence of even traces of albumin in the urine should put the attending physician on his guard and keep him from making any promise as to results.

At the annual election of officers, held at the close of the meeting, Dr. David Bovaird, Jr., was chosen as chairman and Dr. Matthias Nicoll, Jr., secretary of the Section for the ensuing year.

THE WESTERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Thirteenth Annual Meeting, held at Denver, Colo., December 28 and 29, 1903

The President, Alexander Hugh Ferguson, M.D., in the Chair.

Carcinoma of the Lung.—Dr. W. W. Grant, of Denver, Colo., read a paper on this subject in which he reported two cases, one of which recurred after an unusually long interval, and having at one time coincident tubercle bacilli, and occurring several years ago. The other was recent and seemingly primary.

Pancreatic Cyst.—Dr. Grant gave the clinical history of a case of pancreatic cyst. He spoke of the causes of pancreatic cyst, reviewed the literature of reported cases, which showed convincingly that the disease was essentially surgical, and that delay in operating was as dangerous and fatal as in appendicitis. The gengrenous cases could only be saved by promptly opening the abdomen and draining. Formerly and recently reported cases in the *Annals of Surgery*, by Woolsey, which seemed unfavorable for operation, amply attested this. The suggestion in the treatment of the sac was to dissect it out if small, but in the case of a large sac this attempt was manifestly unsafe and dangerous. The extensive adhesions made it exceedingly difficult, and extravasation of pancreatic juice or septic material would probably destroy the patient. Patients had died from this treatment; while to attach the sac to the abdominal peritoneum, if not already adherent, and drain, was safe, and undoubtedly the best treatment of a large cyst. Pancreatic disease often simulated intestinal obstruction, and the statement might be safely accepted that if the surgeon opened the abdomen and did not find obstruction or perforation of the stomach, but observed fat necrosis, the pancreas was, in all probability, the source of the trouble.

Dr. Grant said several writers had considered the differential diagnostic point mentioned by Dr. Harris, but when it was remembered that cases of pancreatic cyst were more frequent in very fat subjects, and that there was quite uniform distention of the intestines, the stomach not being so much distended because of the pressure of the tumor, or, if so, it was entirely out of its normal location, it was difficult, if not impossible, to isolate the transverse colon and the stomach. He had never succeeded in getting any benefit from artificial distention in other cases, although he did not try it in this case.

Accidental Perforations of the Uterus.—Dr. D. S. Fairchild, of Des Moines, Iowa, said that the use of the sound and the curette in gynecological practice was probably the most frequent cause of this accident in legitimate practice. The facility with which the sound could be used in exploring the interior of the uterus and in repositing a retrodisplaced organ was no doubt responsible for some of these accidents. The curette, however, was often used in an indiscriminate manner and as a routine treatment in a great variety of uterine difficulties that could be better treated by other means with a greater prospect of permanent results. He mentioned a case that came under his observation this year which illustrated the ease with which a perforation of an apparently healthy uterine wall could be accomplished, and what was needed in cases of this kind.

Dr. W. L. Bullard, of Pawnee City, Neb., mentioned two cases of perforation of the uterus, one of which was produced by a crochet hook of the ordinary size. An attempt was made to find the hook, but without avail. The patient was left alone. Six months after this she became pregnant, and the crochet hook was discharged through the anterior abdominal wall. Two months later the product of conception was expelled in the natural way.

Treatment of Gastric Ulcer.—Dr. H. D. Niles, of Salt Lake City, Utah, in a paper on this subject, presented the following conclusions: (1) Post-mortem statistics, clinical experience, and recent operating-room observations all tend to confirm the belief that neither the frequency nor the grave importance of gastric ulcer is fully appreciated by the profession generally, and the majority of cases are not recognized as such in life. (2) An earlier and more positive diagnosis means greater alertness in our observation and interpretation of symptoms, and more frequent exploratory operations. (3) In the history of every benign or malignant ulceration situated in a safely accessible region, there is always a time when the pathology can be corrected or favorably modified by appropriate mechanical means. (4) Up to the present time the recognized indications for operative procedures in gastric ulcer have been the symptoms produced by the remote resultant pathology, as hemorrhage, perforation, pyloric obstruction, cancer, etc., but our aim in the future should be to make an earlier diagnosis and by the timely application of a rational treatment prevent the occurrence of these later and more serious manifestations of ulcer. (5) Taking into stricter account the local etiological factors will undoubtedly aid us in the prevention, diagnosis and treatment of gastric ulcer. (6) The causative pathology deserves more consideration in the surgical treatment of gastric ulcer than it has yet received. (7) Perforation always demands the promptest surgical interference. (8) Hemorrhage from gastric ulcer is best treated by gastro-jejunostomy. (9) Open or cicatrized ulcers near the pylorus always indicate rest for the parts and a sufficient outlet for the stomach contents. (10) A posterior gastro-jejunostomy with sutures accomplishes these objects with the minimum risk and the most satisfactory results, and hence should usually be the operation of choice. (11) Our future advancement in the treatment of gastric ulcer must come from an earlier recognition and better understanding of the antecedent coexisting and resultant pathological processes rather than from any further refinements in operative procedures.

Etiology, Symptomatology and Diagnosis of Gastric Ulcer.—Dr. Frank C. Davis, of Des Moines, Iowa, said that clinically the simple ulcer was not so frequent as the statistics of post-mortem examinations would lead one to expect, being from six per cent., as diagnosed by Lebert, to .82 per cent. as observed by Fenwick. In the extensive records collected by Welch, ulcers cicatrized or open was in about five per cent. of persons dying from all causes. Fenwick, from the examination of nearly 48,000 post-mortem records, found scars or ulcers in 4.2 per cent., and in 20,000 autopsies of persons dying from various causes, open ulcer in 1.5 per cent. If one took even the lowest percentage as found post-mortem, namely, 1.5 per cent., it would be seen that every other case was undiagnosed in life. Clinically and pathologically the author classified gastric ulcer as acute, acute secondary, and chronic. Each classification was expatiated upon. Hematemesis was a sign of such unmistakable value that one only needed to exclude a few other sources for the blood to establish a diagnosis by it alone. The symptoms of acute and chronic ulcer were detailed. A conservative estimate of perforation placed it at about 5 per cent. It occurred most frequently in females, which might be accounted for by the fact that many more women suffered from the acute ulcer, and that the chronic ulcer developing from the acute was more liable to perforation. The accident might occur suddenly or be preceded by an increase of pain and vomiting, or by a vomiting of blood.

Perforating Gastric Ulcer.—Dr. Archibald MacLaren, of St. Paul, Minn., said that perforating gastric ulcer was fully as common as extrauterine gestation, and that when the eyes of physicians were opened to this fact, they would be able to see them, diagnose them early, and save many lives that were now lost. In this country he did not believe that the perforation cases reached the hospitals as often as they did abroad. His experience left him to believe that Dr. Richard Harte was correct when he said that rigidity or tension of the abdominal muscles was the keynote to the early recognition of peritoneal perforation from whatever source. The pain might subside, the temperature might not be elevated, but the rigidity continued even up to the end. He believed that many cases could be correctly diagnosed, as was proven by a few cases which he reported, and by the many cases which were constantly being published in the journals.

Dr. Charles W. Oviatt, of Oshkosh, Wis., mentioned the case of a man, sixty-two years of age, a laborer, who had never complained of any symptoms of gastric ulcer. He had eaten a hearty meal, laid down on the lounge feeling perfectly well shortly after, but within an hour he rolled over to the floor with agonizing pain. A physician was called, who gave large doses of morphine hypodermically, without any benefit, and the patient died within a few hours. Post-mortem examination revealed a perforating ulcer in the posterior wall of the stomach which seemingly had attempted to heal. There was no blood in the stomach but the abdominal cavity was filled with stomach contents.

Dr. Charles H. Mayo, of Rochester, Minn., said that after examining 1,100 stomachs by test meals, laboratory testing and physical examination, anemia was a very important factor; next, long-continued neuras-

thenic symptoms. He mentioned one authority who, in examining 2,200 cases at autopsy, found that twenty per cent. of women showed signs of ulcer of the stomach, and only 1½ per cent. of men. Welch, in an examination of eight hundred cases of gastric ulcer, found 60 per cent. in women, and 40 per cent. in men. The speaker and his brother had operated on approximately 400 cases, and of 1,500 cases of stomachs examined, they had found that the proportion was about the same as that given by Welch. Welch also found in an examination of 788 cases of ulcer of the stomach that only 28 occurred in the greater curvature, so that the greater proportion of them were fund in the pyloric end of the stomach. Of cases of cancer of the stomach, Dr. Mayo had elicited a history of chronic ulcer covering a period of from one to fifteen years. His statistics showed 88 per cent. of gastric ulcer, and 12 per cent. of duodenal ulcer. The tendency was more and more to class the first two and a half inches of the duodenum as a part of the stomach. In 31 cases of acute perforation of the stomach and duodenum, 11 occurred in the duodenum in this first 2½ inches, and he had operated on 26 cases of ulcer of the duodenum.

Dr. M. L. Harris, of Chicago, said the extensive experimental work of Futterer showed it was impossible to produce gastric ulcer in an animal until the hemoglobin of the blood had been reduced below a certain point; that all lesions of the mucosa produced in healthy animals readily healed. When the hemoglobin was reduced below a certain point, producing a marked anemia, then these lesions developed into typical ulcers. These observations showed the importance of an examination of the blood in these cases. Another point was the examination of the feces for hematin crystals, as a means of diagnosis in obscure cases of gastric ulcer.

Treatment of Hematemesis by Gastro-enterostomy with Report of a Case.—In a paper on this subject, the author, Dr. F. Gregory Connell, of Leadville, Colo., classified the operative treatment of hematemesis into direct and indirect. Under direct he included (1) excision of the ulcer; (2) partial gastrectomy or pyloroplasty; (3) ligation of the principal artery; (4) cauterization or curettage of the ulcer; (5) ligation of the mucous membrane, and (6) ligation of all coats. Under the indirect he mentioned (1) gastro-enterostomy; (2) pyloraplasty; and (3) gastrotomy. After considering the direct method as a whole, he stated that these were not in common use, because of such objectionable features as the difficulty of locating the ulcer, the fact that the lesion was frequently multiple, the presence of firm and complicating adhesions, and the indistinct limitations of the pathological tissue. The high mortality rate of some and the impracticability and unreliability of others had been the cause of a general turning to the indirect method, as exemplified by gastro-enterostomy. The manner in which a gastro-enterostomy allowed an ulcer to heal was well understood and practically settled, but as to this same operation acting as a hemostatic measure, no such substantial reasons as those advanced for the healing could be presented. While rest and drainage undoubtedly favored clotting and the cessation of hemorrhage from small blood vessels, it was difficult to understand how they could arrest hemorrhage from a large artery with a lateral opening, as in the case reported. As one was unable to determine with any degree of accuracy the nature or the source of the hemorrhage, gastro-enterostomy was indicated only after a thorough search for the bleeding point. The exact status of gastro-enterostomy in hematemesis was not well defined, as was shown by numerous quotations. It had been said that a search for the bleeding point was futile, harmful and unnecessary, and that a gastro-enterostomy would without doubt prevent recurrence of the hemorrhage. To show that gastro-enterostomy would, without doubt, prevent recurrence of the hemorrhage, the author reported one case and cited others from the literature. Gastro-enterostomy was indicated in hematemesis (1) after a thorough search had failed to reveal the source of the hemorrhage. (2) Where the source of the bleeding was discovered, but in such condition as to make direct treatment impracticable or impossible. The conclusion, based upon a sad experience and a review of the literature, was an endeavor on part of the author to discountenance the idea, which had become quite prevalent, that nothing was to be gained by searching for the bleeding point, as gastro-enterostomy was all that would be necessary to prevent recurrence of the hemorrhage.

Two Cases of Acute Hematemesis in which Gastro-enterostomy was Performed.—Dr. Leonard Freeman, of Denver, Colo., detailed a case in which he performed a posterior gastro-enterostomy. A Murphy button was employed, having the end within the stomach smaller than that within the bowel. The stomach contained bloody fluid. Recovery was uninterrupted. The button was passed on the twenty-third day. There was no further hemorrhage. About seven months later this patient suddenly died from hematemesis, the hemorrhage having begun about three months after the operation, small quantities of blood being frequently vomited subsequently. In Case II. a posterior gastro-enterostomy was done, and a Murphy button used, the ends of which were of unequal size. The stomach showed no external sign of ulcer, and no internal exploration was attempted. The organ was markedly dilated with gas and fluid. Reaction from the operation was so satisfactory that hopes of recovery were entertained; but in spite of no recurrence of the hemorrhage, death occurred at the end of fifty hours, due apparently to the great loss of blood. Autopsy revealed an ulcer as large as a watermelon seed on the posterior wall, at the junction of the lower with the upper two-thirds of the stomach. A small atheromatous artery, plugged by a thrombus, could be seen in the floor of the ulcer.

Dr. O. Beverly Campbell, of St. Joseph, Mo., said, in regard to the closure of the opening made in gastro-enterostomy by the suture method, he had performed 16 experiments on dogs. In 12 he used the Kocher method of suturing, and in all of them he did an anterior gastro-enterostomy. The opening in each instance was quite large. The dogs were reoperated at periods of from three to six months, and at the end of three months in six cases the opening was reduced to such an extent that the index finger could not be passed through it without a little force. In six of the cases there was almost total obliteration of the opening at the end of six months. In four there was a slight opening through which only a small probe could be passed. A vicious circle was established in 40 per cent. of the cases. These experiments showed a tendency, where there was no obstruction at the pylorus, for the opening to close, whether it was made with the Murphy button or by the suture method. A larger opening was obtained if the Connell suture or the Kocher suture was used, and in every case the speaker made a rather large opening. Six dogs, in which a vicious circle was established, began to fail in flesh at the end of about two months, and at the end of the third month they were opened and a vicious circle found. In every instance there was more or less narrowing of the opening.

Dr. Charles H. Mayo reported a case in which

gastro-enterostomy failed to arrest hemorrhage. During the past year he operated upon a man forty years of age, who gave a history extending over a few years of occasional stomach disturbance and vomiting of blood. By the laboratory test a little blood was found in the stomach. At the operation, in examining the stomach, he did not find any external evidence of the ulceration. The stomach was dilated. He did a gastro-enterostomy, but there was more hemorrhage after it than before, and the man died at the end of four days. He was very anemic at the time of operation. At the autopsy the intestines were found filled with blood. The gastro-enterostomy was a posterior one, after the Mikulicz method, and the line of suturing was perfect. There were no large ulcers in the stomach, but there were two or three points of erosion.

The Correction of Retrodisplacements of the Uterus.—Dr. Charles W. Oviatt, of Oshkosh, Wis., in a paper on this subject referred to the many operations devised for correcting uterine retrodisplacements. He stated that whatever the operation selected, it should permit of thorough intrapelvic work and should be one that restored the normal axis of the uterus, at the same time leaving it free to adapt itself to its normal range of motion. The operation he described as meeting these requirements was that devised by Dr. George H. Noble, of Atlanta, Ga. A description of the Noble operation could be found in medical literature. During the last year the author had made this operation 23 times. In all but three, there were intrapelvic or other complications. In ten, the appendix vermiformis was removed either because of a history of definite recurring attacks of appendicitis, or because from its appearance it was deemed wise to remove it. In one case a broad ligament cyst was removed, and in several diseased appendages were taken out. These were mentioned to show that there was no difficulty in doing any necessary intrapelvic work through the transverse incision and separation of the recti muscles. In all the cases, local office treatment by means of tampons or pessaries had been resorted to without relief. Most of the cases were in women who were obliged to work and who preferred to undergo an operation rather than submit to further treatment. The three uncomplicated cases were marked neurasthenics with dysmenorrhea. While the displacement remained corrected, there had as yet been no improvement in the dysmenorrhea, and little or none in their general condition. There were no deaths or serious complications following these operations. The advantages of the operation were: Through the one incision any pelvic complication might be treated. The operation utilized the strongest part of the round ligament instead of its distal end. The normal mobility of the uterus was not disturbed, and it was left in the pelvis where it belonged. It caused no bladder irritation and no dragging because the traction on the ligaments was in the direction of their natural course.

The Surgical Treatment of Goiter.—Dr. Charles H. Mayo, of Rochester, Minn., in discussing this subject, said that the respect American surgeons held as to the ability of Continental surgeons was to a considerable extent due to their statistics on goiter. To the peculiar formation of the capsule of the thyroid were due many of the symptoms occasioned by enlargement. Closely investigating the gland, it divided posteriorly and also enclosed the trachea, esophagus, and part of the pharynx. Accessory glands were not uncommon in the lines of inversion from the pharynx in the original formation of the organ. It was probable that the lymphatic system acted as its duct, and a study of the function of the lymphatics would explain some factors in the etiology of diseases of this body. In young people at the age of sexual activity, enchymatous goiters were quite common, but, as a rule, readily responded to treatment. Reverdin, in an analysis of 3,408 cases, placed the mortality from total extirpation at 19 per cent.; partial, 3½ per cent.; from intraglandular enucleation, at .78 per cent.; from resection, at 6.6 per cent. The writer's experience was derived from 108 operations upon thyroid tumors. Of these, there were 34 exophthalmic cases, with 6 deaths; 2 malignant, with 1 death; one large lingual thyroid. Two cases presented separated tumors of the pyramidal lobe. There were 71 cases of cystic, colloid, adenomatous and mixed types of goiter operated upon, with one death, from pneumonia, on the eighth day. The recurrent laryngeal was permanently injured once, and its function temporarily impaired several times. The Kocher collar incision was ordinarily used and a free exposure of the gland made. The overlying muscles were either tracted aside or severed, according to the case. If the capsule was thickened over the local tumor, or whole gland, the Socin method of enucleation was commonly employed. If the gland retained its general form, the largest lobe, usually the right, was extirpated, frequently leaving its posterior capsule to protect the laryngeal nerve. Ether anesthesia was usually employed. Occasionally cocaine was used locally, if there was much tracheal disturbance or severe exophthalmic symptoms. Chloroform was rarely given. All anesthetics were preceded by a hypodermic of morphine. Some thyroidism usually followed for one to three days.

Intestinal Perforation in Typhoid Fever.—Dr. Byron B. Davis, of Omaha, Neb., referred to the statistics of Taylor, Osler, Finney, Keen, and others, and said that even under the past dilatory tactics the results had been very gratifying. The first 24 operations for typhoid fever reported showed six recoveries, or 25 per cent. When it was considered that a very large number of the operations thus far reported for typhoid fever had not been done until general peritonitis had been fully established, 50 per cent. of recoveries did not seem unreasonable, if operation was done before the advent of the peritonitis. The latest statistics from Johns Hopkins gave 41 per cent. of recoveries. There they were striving to operate for the perforation merely, but several cases were recorded with a fully developed peritonitis. Another point affecting the mortality was that a small per cent. of the cases dying after operation did not die from the operation *per se* or the perforation, but as a result of the general typhoid infection. The author thought such cases should not be charged against the operation.

Dr. A. I. Bouffleur, of Chicago, referred to the differential diagnosis between perforation and hemorrhage. One case operated on by him was one in which there was a difference of opinion as to whether or not hemorrhage or perforation was present. This case occurred several years ago, before the value of a blood count was emhasized. Operation was performed, and the patient recovered. The case emphasized the point that even in cases of doubt as to whether there was perforation or marked hemorrhage, operation was not necessarily fraught with serious danger.

Surgical Treatment of Nephritis.—This was the title of the President's Address, delivered by Dr. Alexander Hugh Ferguson, of Chicago. Reference was made to the early history of this subject, and to the priority of the operation. The author added three cases to those he had already published of renal decapsulation and puncture for active diffuse nephritis. In looking over the literature, the author finds that the causes of death after the operation in 123 cases, by different surgeons, were as follows: Four died of pulmonary edema;

6 of uremia; 4 of coma; 3 of sudden heart failure; 3 of exhaustion, and 1 each of endocarditis, suppression of urine (ether being used), anuria, general dropsy, collapse, pleuritic effusion, and myocardial thrombosis. There were 27 deaths out of 123 cases within a year after the operation. A closer analysis shows that of these 27 deaths, 6 died within 18 hours after the operation; 9 between one and nineteen days; 2 between two and seven weeks; 3 between two and three months, and 1 lived a year. The vast majority of these deaths should not be attributed to the operation. Even allowing all deaths within a week to be due to the operation, there would be a mortality of only about nine per cent. When the limitations of the operation were more clearly defined, and many of the extreme cases left alone, the author thought the mortality should not be more than five per cent. in the hands of experienced surgeons. It was fair to conclude that the earlier an operation was performed in these cases, the less would be the fatality, and the greater the benefits.

(To be Continued.)

JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

Stated Meeting, held January 4, 1904.

Effect of Altitude on Blood Corpuscles and Blood Plates.—Dr. G. T. Kemp, of the University of Illinois, read this paper, in which the conclusions reached during a trip to Colorado for the study of the blood were reported. Observations on the blood of six healthy individuals were made at varying altitudes on the plains, at Cripple Creek and on the summit of Pike's Peak. The well-established fact, known since the time of Behr and Biot, that rise in altitude causes an increase in the red blood corpuscles, was illustrated in the counts made on this expedition, but at the summit of Pike's Peak, in addition to this text-book increase, a marked variation between the morning and afternoon count was noted. Early in the day the red blood corpuscles were much higher than later and in one case this difference, which was always over 500,000, amounted to 1,000,000. In a general way the hemoglobin curve followed that of the reds, but not exactly; and the variations of the hemoglobin were less marked than in the corpuscles. For this reason when the corpuscles were markedly diminished in number each one was carrying a high percentage of hemoglobin. The ratio of the blood plates to the reds (normally 1 to 15) was fairly high in Illinois. At Cripple Creek an enormous fall took place, signifying of course a marked increase in the number of plates. This fall which continued during the stay in a high altitude was more marked, more regular and of longer duration than the changes in corpuscles or hemoglobin. This fact would seem to point to a new and safe and more constant indication as to the blood condition in the ratio of plates to corpuscles. As to the nature of blood plates Dr. Kemp's work tends to favor Hayem's theory —that they are hematoblastic; for after the increase in plates had continued for a while hemoglobin was found in them both by ocular and chemical tests. By artificial gastric digestion Dr. Kemp found that the platelets are rich in nuclear matter relatively to the corpuscles. The leucocytes were not affected by the altitude and it looks as if the blood plates had some genetic relation with the reds but not with the whites. In counting the plates an extremely small amount of blood must be drawn and a drop of methyl green (containing some formaldehyde for fixing purposes) placed over it. The count should be made with a one-twelfth oil lens.

Dr. Welch, in the discussion, said that in disease the platelets vary greatly in number, so that in any case one has to know the normal for that individual to draw any inference as to the number of red blood corpuscles. "Platelets" is not an exact term. He agrees with Arnold, who lays some stress on the granular material of the blood.

Dr. Osler remarked that large numbers of blood plates are seen clinically in two classes of patients; first, in the new-born, and second, in every case of marked cachexia. They are not, however, present in large numbers in cases where there are evidences of blood regeneration. He has never seen a platelet containing hemoglobin, the only point about which he is sure, being that, whatever their origin, the blood platelets are a definite morphological element of the blood.

Vaccine and Vaccination.—Dr. Dock, of Ann Arbor, Mich., read this paper. No method for the determination of the dose for vaccine has ever been devised. We measure it roughly by the lesion produced or by the degree of immunity conferred, but the existence of normal immunity makes the latter method quite inexact. In the early days the so-called lymph was obtained from spontaneous cowpox. Next humanized virus was used, being passed from arm to arm (in one case for forty-four years). But it was found that the lymph eventually died out and so cowpox or accidental horsepox was used as its source. Later retrovaccination was done with the idea of increasing the virulency by changing the medium. In the next few years humanized serum was used, but the transference of syphilis told against this method. In the early days the lymph was dried between glass plates, on linen threads, glass stoppers, quills, lancets and even thorns. Capillary tubes were also used early in the history of vaccination. The lymph has been applied in various ways—by actual incision, by hypodermic injection and by forcing it under a blister artificially produced. The vaccine pulp contains (beside the liquid) leucocytes, fat, specific and accidental germs; but in spite of the objections to it it is always used in Germany where vaccination is thorough and successfully done. In the preparation of vaccine, young calves—usually females—are used. After previous washing and inspection linear scarifications are made (usually on the abdomen), with aseptic precautions. The seed virus, either of cow or human pox, is then smeared on. In a few days the vesicles form, the skin is again washed and pulp is collected by scraping with a curette. The lymph was formerly mixed with various antiseptics, but now nothing but glycerin is used. In the United States there is absolutely no control over vaccine manufacture, and Rosenau showed that much of the lymph in circulation is badly contaminated. As to the method of vaccination, the scab should not be too large, nor should it be too superficial. In Germany an incision is used entirely, and this method is a very good one. Glycerinized lymph gives a small bacterial content with good specific properties.

Dr. Welch, in the discussion, said that tetanus has undoubtedly been carried by vaccine lymph, for the inoculation experiments to the contrary are by no means satisfactory. Certainly inflammatory conditions are so carried and this fact is a national disgrace. A board of health having control of vaccine manufacture throughout the country is badly needed.

Stated Meeting, held Monday, January 18, 1904.

Results of Some Recent Experiments on Blood Pressure.—Dr. Erlanger read this paper. The pressure usually estimated is the maximum pressure, but the difference between this and the minimum pressure (a quantity which Dr. Erlanger calls the pulse pres-

sure) is, he has found the most important thing to determine. It measures the velocity of the blood flow, corresponds to the mean blood pressure and is nearer the minimum than the maximum. It was found that in the apparatus usually used to measure blood pressure the variations in the size of cuff lead to inaccuracy in the results; for by determining the intra-arterial pressure (which is, of course, the true blood pressure), the readings when a narrow cuff was used were found to be always too high. By placing the cuff on the bared artery this elasticity error was found to be in the tissue, and it was shown that when we determine blood pressure clinically in the brachial artery we practically measure it in the aorta. A case of postural albuminuria was studied with reference to arterial pressure, and it was found that with the patient recumbent the pressure was lowest, that it rose on standing and fell again on sitting. The maximum pressure, however, showed practically no changes with the posture. The pulse rate varied inversely with the pulse pressure, but the volume of the arm used in the determination varied directly with the pressure. The albuminuria disappeared when the patient sat or lay down, but was present when he stood, and the angle at which it appeared was found to be 30°, the place at which pressure changes were first noticed. It was found that increased pulse pressure gave a diminution in the urine output with an increase of the solids and the nitrogen. Albumin in the urine means a lowered vitality of the renal epithelium, but these experiments suggest that the circulatory changes may be the primary factor. The pulse pressure and not the maximum pressure, which is the quantity usually estimated, is the important feature in blood-pressure work. Dr. Futcher referred to a recent case of cyclic albuminuria in which a fairly large albumin content with a high blood pressure changed, by means of rest in bed, to a trace of albumin and a pressure of 112 mm. of mercury.

Mental Symptoms Connected with Distinct Visceral Changes.—Dr. Carey Gamble reviewed Dr. Head's recent paper. Head divides the symptoms into hallucinations, moods of depression, etc., suspicions, loss of memory and attention and active insanity. Dr. Gamble reported several cases which seemed to agree with Dr. Head's theory that insanity is nothing more than mental wrongness and due to visceral changes. The first was a case of mitral stenosis with hallucinations of sight occurring in the morning, and after attacks of pain. In another patient asthma was associated with olfactory disturbances in which coffee gave the sensation of H_2S. Another showed auditory delusions with periods of depression. In this case the visceral changes were adherent pericarditis. Two of the cases with stenotic lesion of the mitral valve expressed their mental changes in periods of depression and exaltation and moods of suspicion. In one patient associated with asthma and emphysema there was a loss of attention and memory and great unreasoning fear. Depression with arteriosclerosis and hallucinations with aortic insufficiency were the other two cases in the series.

Dr. Paton called attention to the fact that the mental symptoms following acute diseases may be either the ordinary neurasthenic conditions, which are stable in character, or the so-called psychasthenic conditions; and we know of no explanation why they should assume one character rather than the other.

Periureteral Arterial Plexus.—Dr. Sampson read a paper on this subject. His attention had been called to this anatomical feature by the importance of the ureters in operations for carcinoma of the cervix. The plexus is supplied by the ovarian, renal, uterine, vaginal and iliac arteries and also gets direct branches from the aorta. The anastomosis is free and any vessel in the plexus may be injected from any other. Dr. Sampson found that when the smaller branches which are intimately connected with the ureters were stripped off and slight damage done to the ureter necrosis occurred. Clinically the ovarian, internal iliac and uterine arteries have been tied with the idea of reducing the blood supply of malignant growth and no necrosis has followed. This is, of course, easily explained by the part which the renal artery takes in the formation of the periureteral plexus. The pelvic portion of the ureter is inclosd in a fibrous sheath and one must, in operating on a carcinomatous uterus, guard against any interference with the periureteral plexus and any undue insult to the fibrous sheath in which it runs.

BOOKS RECEIVED.

The MEDICAL NEWS *acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the* MEDICAL NEWS *will shortly appear.*

REPORT OF THE STATE BOARD OF HEALTH OF WISCONSIN. 8vo, 304 pages. Madison, 1903.

THE BLUES. By Dr. A. Abrams. 8vo, 240 pages. Illustrated. E. B. Treat & Co., New York.

PATHOGENIC MICROBES. By Dr. P. Jousset. 12mo, 192 pages. Boericke and Tafel, Philadelphia.

THE SELF-CURE OF CONSUMPTION. By Dr. C. H. Davis, 12mo, 176 pages. E. B. Treat & Co., New York.

ANATOMY APPLIED TO MEDICINE AND SURGERY. By Dr. D. E. Mundell. 499 pages. British Whig, Kingston, Jamaica.

ANNUAL REPORT OF THE COMMISSION OF EDUCATION. 1902. Vol. I. Government Printing Office, Washington, D. C.

THE PREVENTION OF CONSUMPTION. By Dr. A. Hillier. 12mo, 226 pages. Illustrated. Longmans, Green & Co., New York.

BACTERIA, YEASTS AND MOLDS IN THE HOME. By Dr. H. W. Conn. 12mo, 293 pages. Illustrated. Ginn & Co., Boston.

NORMAL HISTOLOGY. By Dr. J. R. Wathen. 12mo, 229 pages. Illustrated. Lea Brothers & Co., Philadelphia and New York.

ELEMENTS OF SURGICAL DIAGNOSIS. By Dr. A. Pierce Gould. Third Edition. 12mo, 607 pages. W. T. Keener & Co., Chicago.

THE PRACTICAL CARE OF THE BABY. By Dr. T. W. Kilmer. 12mo, 158 pages. Illustrated. F. A. Davis Co., Philadelphia.

DISINFECTION AND PRESERVATION OF FOOD. By Dr. S. Rideal. 8vo, 494 pages. Illustrated. John Wiley & Sons, New York.

THE PURIN BODIES OF FOODSTUFFS. By Dr. I. W. Hall. Second edition. 12mo, 201 pages. Sherritt & Hughes, Manchester, England.

ORGANIC AND PHYSIOLOGIC CHEMISTRY. By Dr. A. McGlannan. 12mo, 246 pages. Lea Brothers & Co., Philadelphia and New York.

MANUAL OF MEDICINE. By Dr. T. K. Munro. 8vo, 901 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia and London.

COMPEND OF DISEASES OF THE EYE, NOSE AND THROAT. By Dr. J. J. Kyle. 12mo, 280 pages. Illustrated. P. Blakiston's Son & Co., Philadelphia.